MGE™ Galaxy™ 7000

160 – 500 kVA

Installation manual

Single UPS

Modular UPS

Parallel UPS with SSC

Frequency converters

Static-switch cabinet

APC®

by Schneider Electric

Introduction

Thank you for selecting an APC by Schneider Electric product to protect your electrical equipment.

The **MGE™ Galaxy™ 7000** range has been designed with the utmost care.
We recommend that you take the time to read this manual to take full advantage of the many features of your **UPS** (**U**ninterruptible**P**ower **S**upply).

APC by Schneider Electric pays great attention to the environmental impact of its products.
Measures that have made **MGE™ Galaxy™ 7000** a reference in environmental protection include:

- the eco-design approach used in product development,
- the elimination of harmonic disturbances reinjected into the AC source,
- production in an ISO 14001 certified factory,
- recycling of the **MGE™ Galaxy™ 7000** at the end of its service life.

To discover the entire range of APC by Schneider Electric products and the options available for the **MGE™ Galaxy™ 7000** range, we invite you to visit our web site at: **www.apc.com**, or contact your local representative.

All products in the **MGE™ Galaxy™ 7000** range are protected by patents. They implement original technology not available to competitors of APC by Schneider Electric.

To take into account evolving standards and technology, equipment may be modified without notice. Indications concerning technical characteristics and dimensions are not binding unless confirmed by APC by Schneider Electric.

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"**MGE™ Galaxy™ 7000** installation manual no. 3402084600".

Pictograms

Document

Danger, these instructions are imperative

Audio signal

Information, advice, help.

LED off

Visual indication

LED flashing

Action

LED on

Safety

Safety rules

Safety of persons

The UPS must be installed in a room with restricted access, in compliance with standard IEC 60364-4-42.
Only qualified personnel are authorised to enter this restricted access room.
A UPS has its own internal power source (the battery). Consequently, the power outlets may be energised even if the UPS is disconnected from the AC-power source.

Dangerous voltage levels are present within the UPS. It should be opened exclusively by qualified service personnel.
The UPS must be properly earthed.
The battery supplied with the UPS contains small amounts of toxic materials. Caution, replacement of the battery by a battery of the wrong type can result in an explosion.
To avoid accidents, the instructions below must be observed.

- **Never operate the UPS if the ambient temperature and relative humidity are higher than the levels specified in the documentation.**
- **Never burn the battery (risk of explosion).**
- **Do not attempt to open the battery (the electrolyte is dangerous for the eyes and skin).**
- **Comply with all applicable regulations for the disposal of the battery.**
- **Caution, wait for five minutes before opening the UPS to allow the capacitors to discharge.**
- **Caution, there is high leakage current: the earthing conductor must be connected first and disconnected last.**
- **The product must be installed on a non-inflammable surface (e.g. concrete).**
- **Caution: battery replacement must be carried out by qualified personnel.**
- **Isolate the UPS before working on the circuits upstream**
- **The UPS can only be used in a controlled environment.**

Product safety

- Protection (circuit breaker/switch disconnector) must be installed upstream and be easily accessible.
- Never install the UPS near liquids or in an excessively damp environment.
- Never let a liquid or foreign body penetrate inside the UPS.
- Never block the ventilation grates of the UPS.
- Never expose the UPS to direct sunlight or a source of heat.
- When replacing battery cells, use the same type and number of cells.

Special precautions

- The UPS connection instructions contained in this manual must be followed in the indicated order.
- Check that the indications on the rating plate correspond to your AC-source system and to the actual electrical consumption of all the equipment to be connected to the UPS.
- If the UPS must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -25°C to +45°C.
- If the UPS remains de-energised for a long period, we recommend that you energise the UPS for a period of 24 hours, at least once every month. This charges the battery, thus avoiding possible irreversible damage.
- The UPS is designed for normal climatic and environmental operating conditions concerning the altitude, ambient operating temperature, relative humidity and ambient transport and storage conditions.
- Using the UPS within the given limits guarantees its operation, but may affect the service life of certain components, particularly that of the battery and its autonomy. The maximum storage time of the UPS is limited due to the need to recharge its integrated battery.
- Unusual operating conditions may justify special design or protection measures:

- harmful smoke, dust, abrasive dust,
- humidity, vapour, salt air, bad weather or dripping,
- explosive dust and gas mixture,
- extreme temperature variations,
- poor ventilation,
- conductive or radiant heat from other sources,
- cooling water containing acid or impurities which may cause scale, silt, electrolysis or corrosion of the converter parts exposed to water,
- strong electromagnetic fields,
- radioactive levels higher than those of the natural environment,
- fungus, insects, vermin, etc.,
- battery operating conditions.

- **The UPS must always be installed in compliance with:**
  - **the requirements of standard IEC 60364-4-42: protection from thermal effects.**
  - **standard IEC 60364-4-41: protection against electric shock.**
  - **standard NFC 15-100 (in France).**
  - **the requirements of standard IEC 62040-1-2.**

APC by Schneider Electric has implemented an environmental protection policy.
Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.
The cardboard we use comprises over 30% of recycled cardboard.
Sacks and bags are made of polyethylene.
Packing materials are recyclable and bear the appropriate identification symbol

Materials	Abbreviation	Number in the symbol
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packing materials.

End of life

APC by Schneider Electric will process products at the end of their service life in compliance with local regulations.
APC by Schneider Electric works with companies in charge of collecting and eliminating our products at the end of their service life.

Product
The product is made up of recyclable materials.
Dismantling and destruction must take place in compliance with all local regulations concerning waste.
At the end of its service life, the product must be transported to a processing centre for electrical and electronic waste.
Make the product unusable by cutting the internal supply cables.

Battery
The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.
The battery may be removed to comply with regulations and in view of correct disposal.
The "Material Safety Data Sheets"(MSDS) for the batteries are available on our web site*.

(*) For more information or to contact the Product Environmental manager, use the "Environmental Request" form on the site: http://environment.apc.com

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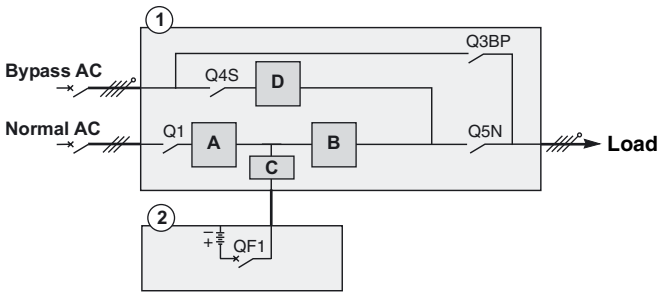
1.1 Possible installations

Single or modular UPS alone



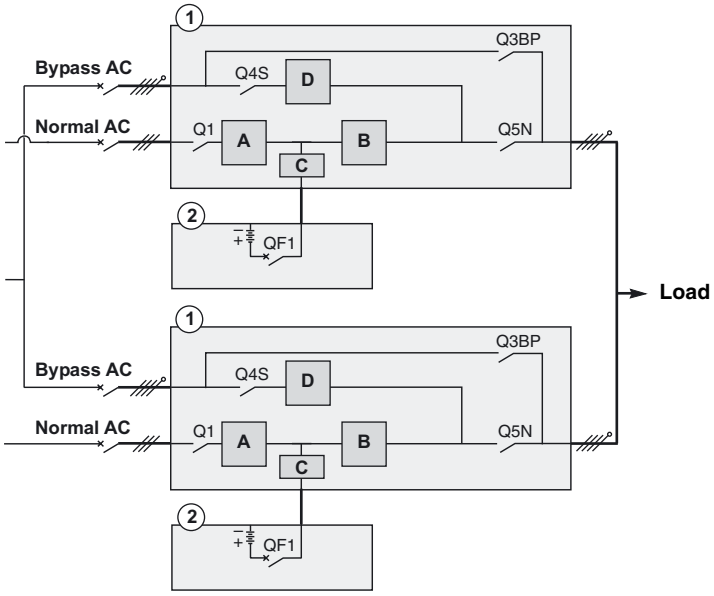
UPS cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**
Static-switch on AC bypass line **D**

Batteries **(2)**

Parallel UPS systems

(8 units maximum)

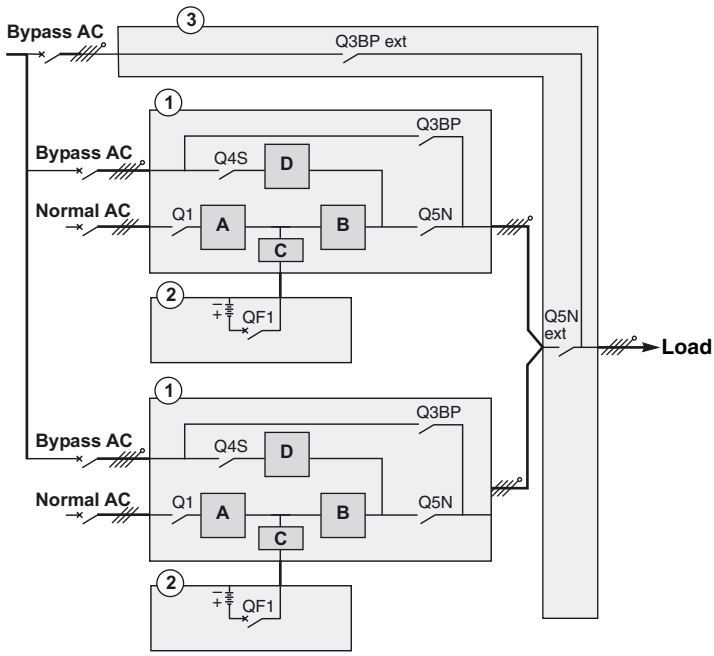
Modular UPSs in parallel



UPS cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**
Static-switch on AC bypass line **D**

Batteries **(2)**

Modular UPSs in parallel with external bypass cabinet

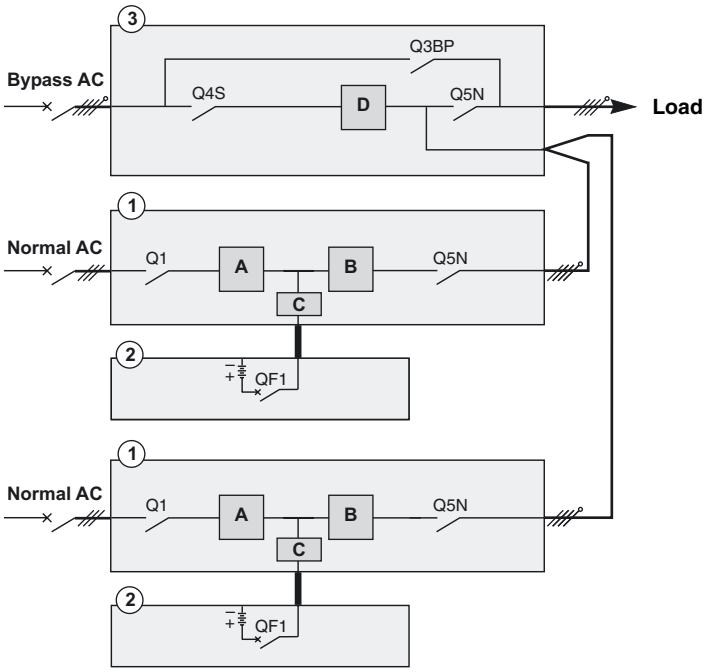


UPS cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**
Static-switch on AC bypass line **D**

Batteries **(2)**
External bypass cabinet **(3)**

1. Installation

Parallel UPSs with SSC (static-switch cabinet)

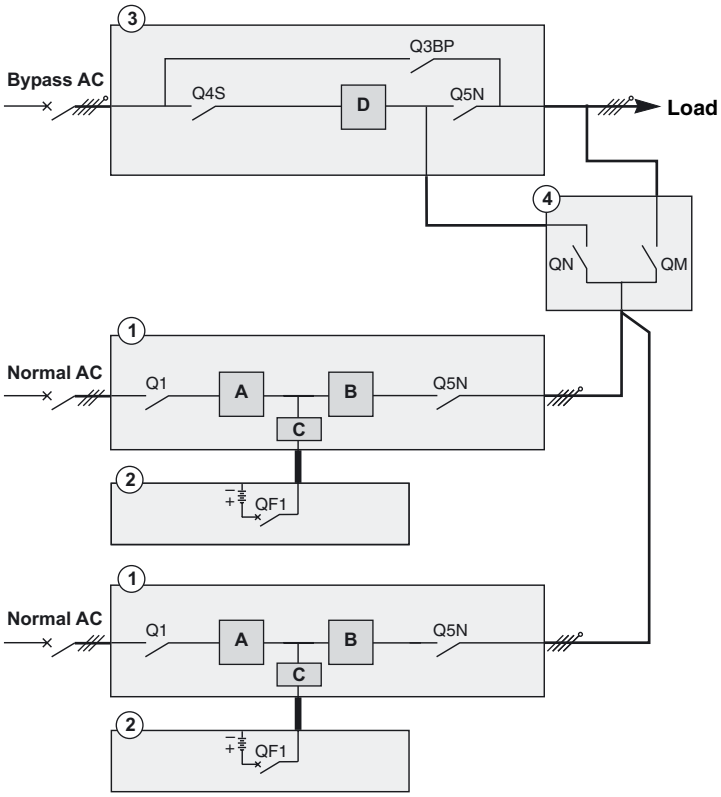


UPS 1 cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**

Batteries **(2)**

SSC **(3)**
Static-switch on AC bypass line **D**

Parallel UPSs with SSC and SSC maintenance cabinet



UPS 1 cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**

Batteries **(2)**

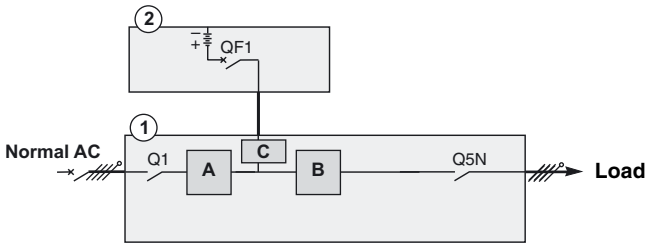
SSC **(3)**
Static-switch on AC bypass line **D**

SSC maintenance cabinet **(4)**

UPS set up as a frequency converter

(with or without battery, maximum eight units)

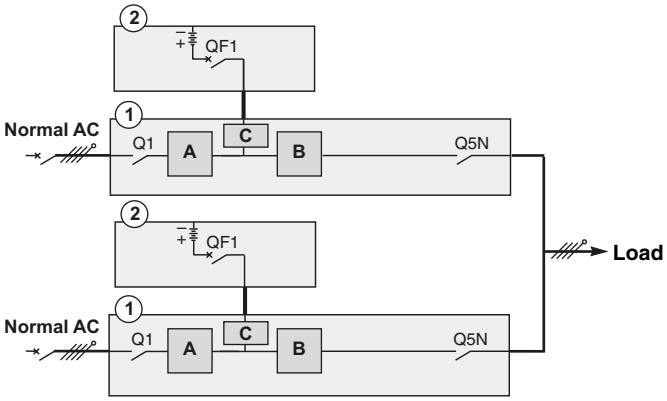
Single UPS



UPS cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**

Batteries **(2)**

Parallel UPS systems



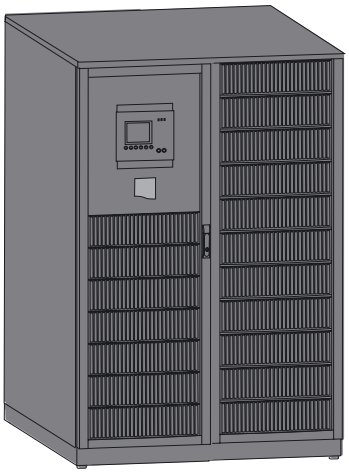
UPS cabinet **(1)**
PFC rectifier module **A**
Inverter module **B**
Battery chopper **C**

Batteries **(2)**

1. Installation

1.2 Layout

Dimensions



	Overall dimensions H x W x D in mm	
	Unpacked cabinet	**On pallet cabinet**
UPS cabinets in kVA		
160 - 300	1900 x 1412 x 849	2027 x 1525 x 970
400	1900 x 1412 x 849	2027 x 1525 x 970
500	1900 x 1812 x 849	2027 x 1925 x 970
SSCs in kVA		
800	1900 x 1012 x 849	2027 x 1125 x 970
1200	1900 x 1412 x 849	2027 x 1525 x 970
2000	1900 x 1412 x 849 1900 x 1012 x 849	2027 x 1525 x 970 2027 x 1125 x 970
2000 light	1900 x 1012 x 849	2027 x 1125 x 970
External bypass or SSC maintenance cabinets in kVA		
800	1900 x 1012 x 849	2027 x 1125 x 970
1200	1900 x 1412 x 849	2027 x 1525 x 970
2000	1900 x 1412 x 849	2027 x 1525 x 970
Battery or Auxiliary cabinets (mm width)		
400	1900 x 412 x 849	2027 x 959 x 970
700	1900 x 712 x 849	2027 x 825 x 970
1000	1900 x 1012 x 849	2027 x 1125 x 970
1400	1900 x 1412 x 849	2027 x 1525 x 970

Weights

Weight values are purely indicative.
See the packing labels for the precise weight of the equipment.

UPS cabinets

Power rating in kVA	**160**	**200**	**250**	**300**	**400**	**500**
Max. weight in kg	**840**	**840**	**990**	**990**	**1140**	**1500**

SSC

Power rating in kVA	**800**	**1200**	**2000**	**2000 light**
Max. weight in kg	**450**	**790**	**1480**	**660**

External bypass cabinets or SSC maintenance cabinets

Power rating in kVA	**800**	**1200**	**2000**
Max. weight in kg	**340**	**480**	**730**

Auxiliary cabinets (empty)

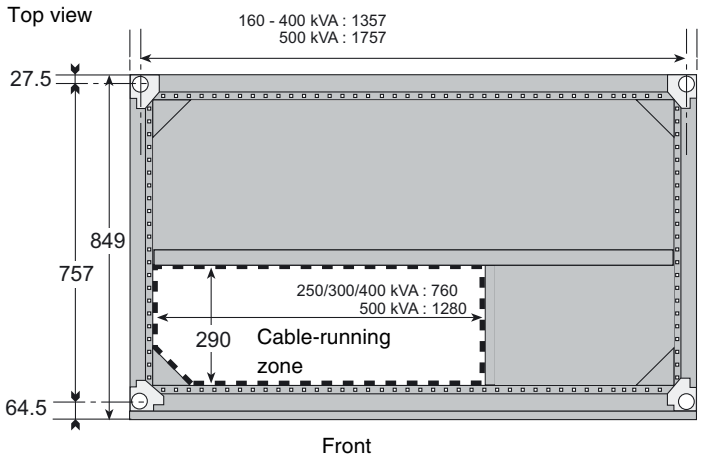
Power rating in kVA	**400**	**700**	**1000**	**1400**
Max. weight in kg	**90**	**135**	**150**	**200**

Floor mounting

Normal or false floor.

Dimensions are indicated in millimetres.

UPS cabinets



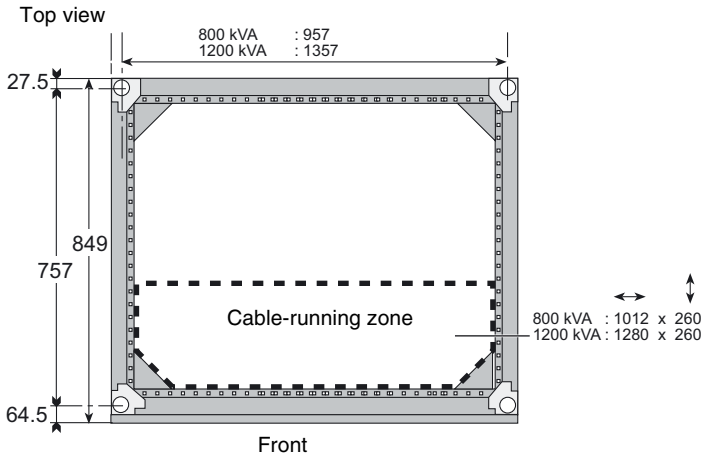
The four feet (6 feet for 500 kVA UPS) of the cabinet are cylindrical, 60 mm in diameter. The measurements opposite include the cabinet cover panels and the door.

Max. load on floor per square cm for the feet:

UPS cabinet in kVA	Kg/cm2
160	9
200	9
250	11
300	11
400	13
500	11

SSC

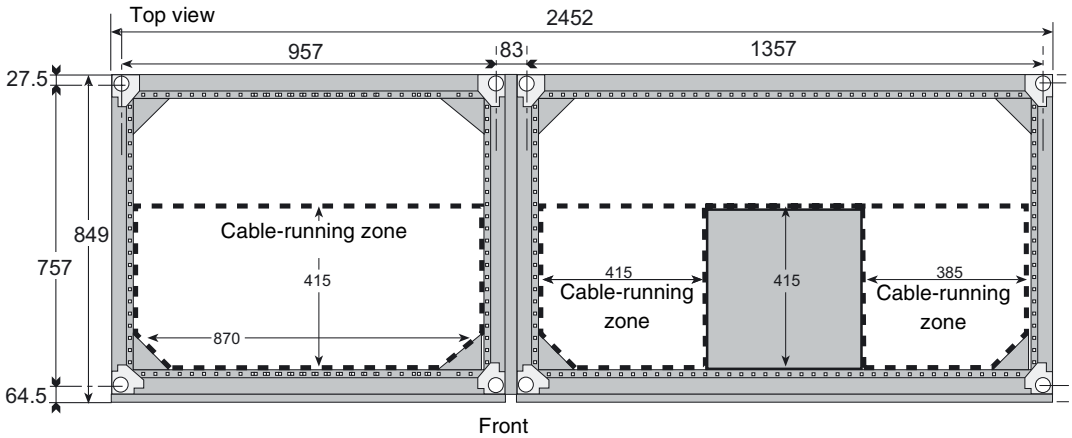
800 and 1200 kVA



Max. load on floor per square cm for the feet:

SSCs in kVA	Kg/cm2
800	5
1200	9
2000	9
2000 light	7

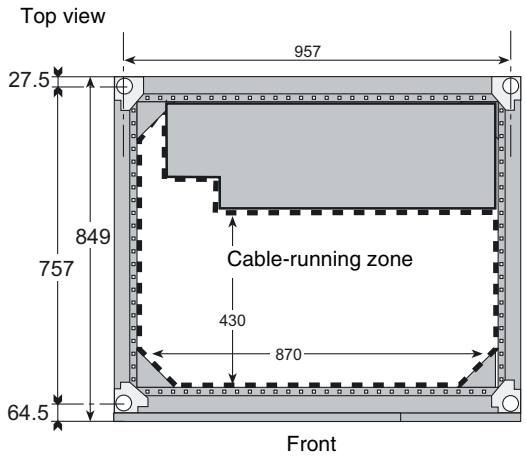
2000 kVA



1. Installation

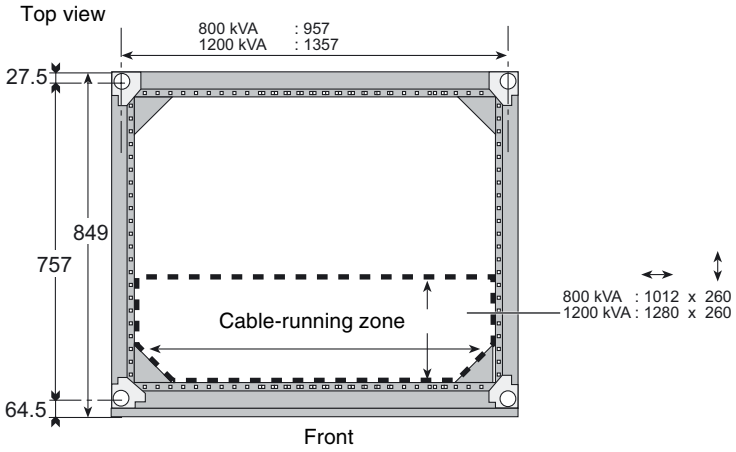
Layout > Floor mounting

2000 kVA light



External bypass or SSC maintenance cabinets

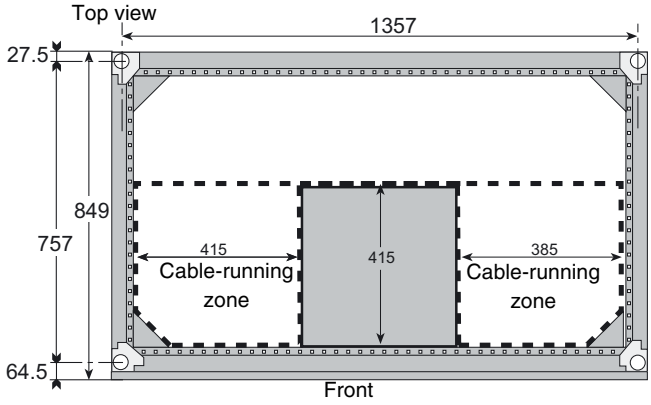
800 and 1200 kVA



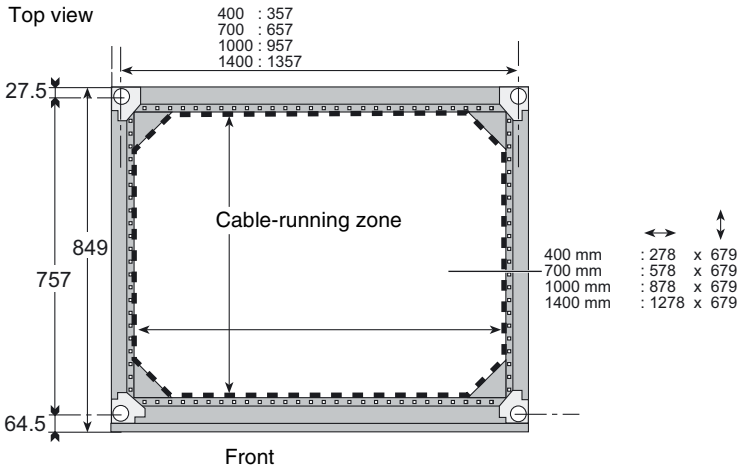
Max. load on floor per square cm for the feet:

External bypass or SSC maintenance cabinet in kVA	Kg/cm2
800	4
1200	5
2000	8

2000 kVA



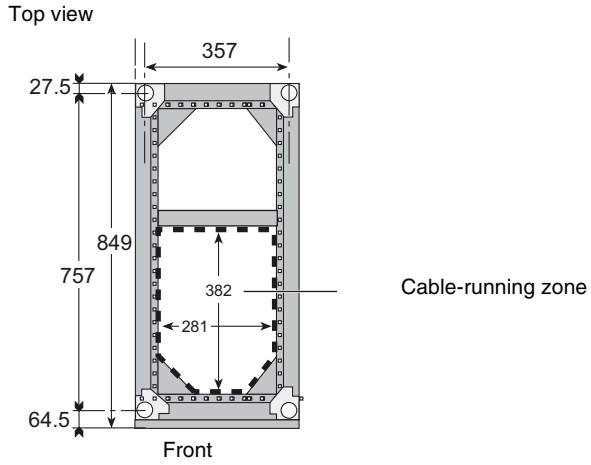
Auxiliary cabinets (empty)



Max. load on floor per square cm for the feet:

Auxiliary cabinet in mm	Kg/cm2
400	0,9
700	1,2
1000	1,3
1400	1,8

Backfeed cabinet



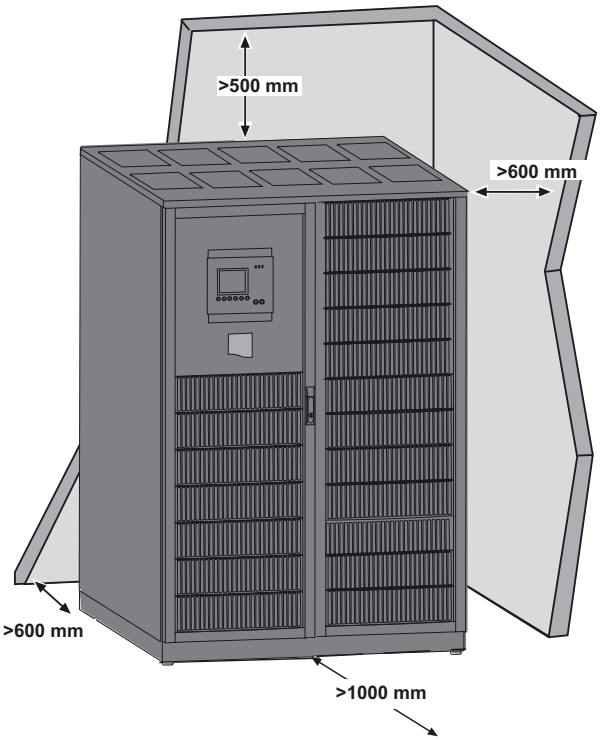
1. Installation

Layout >

Position in room

UPS cabinets

The UPS must be installed in a room with restricted access (qualified personnel only).



To ensure correct ventilation, leave nothing on top of the UPS.

Leave one meter of free space in front of the UPS for door opening.

The cabinet rests on four cylindrical feet, 60 mm in diameter, positioned in the four corners of the cabinet to spread the weight. (6 feet for 500 kVA UPS with two feet in the centre).

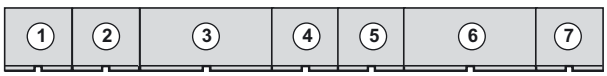
If 500 mm of free space is not maintained above the UPS, abnormal temperature rise may occur.

The UPS can operate correctly back to the wall, but it is preferable to leave some space for easier maintenance.

The distance between the bottom panel and the floor must be less than 10 mm.

SSCs

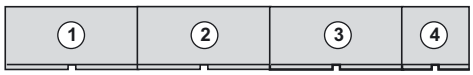
Layout example for an SSC with two parallel UPS units



Auxiliary cabinet 2 **(1)**
Battery cabinet 2 **(2)**
UPS 2 cabinet **(3)**
Auxiliary cabinet 1 **(4)**
Battery cabinet 1 **(5)**
UPS 1 cabinet **(6)**
SSC (7)

External bypass cabinets

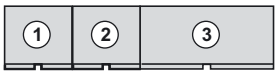
Layout example for an external bypass cabinet with three UPSs



UPS 1 cabinet **(1)**
UPS 2 cabinet **(2)**
UPS 3 cabinet **(3)**
External bypass cabinet **(4)**

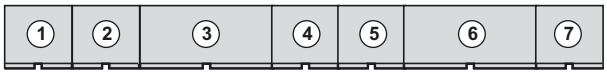
Battery / auxiliary cabinets

Layout example for two battery cabinets with one UPS unit



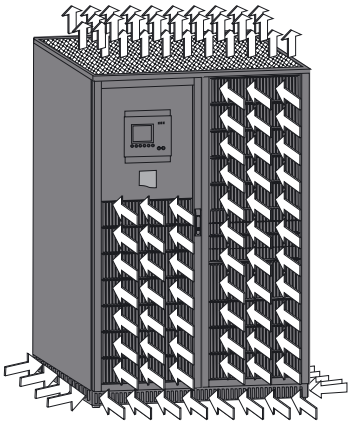
Battery cabinet 1 (1)
Battery cabinet 2 (2)
UPS cabinet **(3)**

Layout example for two battery cabinets and two auxiliary cabinets in two parallel UPSs with an SSC



Auxiliary cabinet 2 (1)
Battery cabinet 2 (2)
UPS 2 cabinet **(3)**
Auxiliary cabinet 1 (4)
Battery cabinet 1 (5)
UPS 1 cabinet **(6)**
SSC **(7)**

Ventilation



The optimum operating temperature range is 20 to 25°C.

An operating temperature of 35°C is possible, but battery life will be greatly reduced.

Size the ventilation system taking into account the values in the table below.

UPS cabinets

Power rating in kVA		160	200	250	300	400	500
Air flow (in m3/h)		6000	6000	6000	6000	6000	8300
Heat losses to be evacuated at Pn	kW	10,5	13,5	14,9	18,6	22,6	27,2
	Cal./s	2511	3238	3554	4449	5395	6501

SSCs

Power rating in kVA		800	1200	2000	2000 light
Air flow (in m3/h)		1000	Natural	Natural	Natural
Heat losses to be evacuated at Pn	kW	3,7	< 1	< 1,5	< 1,5
	Cal./s	884	< 240	< 360	< 360

Pn = rated power; for other values, please consult the after-sales support or the local office

1. Installation

1.3 Prerequisites

UPS currents

UPS cabinets in kVA	I rated of Normal AC in A	I rated of Bypass AC in A	I rated of load in A	I battery in A
160	225	231	231	313
200	281	289	289	392
250	351	361	361	490
300	420	433	433	588
400	558	577	577	784
500	700	722	722	980

The table above is for 400 V interphase voltages and a load with a power factor of 0.9.
For other voltages (380 V or 415 V), the current values must be multiplied by 1.05 and 0.96 respectively.
The battery current is an average current for a battery voltage of 488 V (44 blocks at 1.85 V/cell each), at Pn with a power factor of 0.9.

Recommended upstream protection

Normal AC source

Stick a label with the following text on each upstream circuit breaker / switch-disconnector: "Isolate Uninterruptible Power Supply (UPS) before working on this circuit".
Protection ratings are calculated for the maximum continuous current (at 380V).

UPS cabinets in kVA	CB/switch-disconnector	Trip unit
160 - 200	NSX 400 3P*	STR 23 SE
250 - 300	NSX 630N 3P *	STR 23 SE
400	NSX 800N 3P *	Micrologic 2.0
500	NSX 800N 3P *	Micrologic 5.0

The circuit breakers / switch-disconnectors recommended above respect the requirements for discrimination with the UPS fuses.
Depending on the installation, the CB/SD may be replaced by a CB/SD with a higher breaking capacity.
*** For short-circuit currents > 40 kA, use a CB/SD with a higher breaking capacity (type L or H).**

Bypass AC source

Stick a label with the following text on each upstream circuit breaker / switch-disconnector: "Isolate Uninterruptible Power Supply (UPS) before working on this circuit".
Protection ratings are calculated for the maximum continuous current (at 380V).

UPS cabinets in kVA	Maximum permissible current for 20 ms	CB/switch-disconnector	Trip unit
160	23 In	NSX 400 4P *	STR 23 SE
200	19 In	NSX 400 4P *	STR 23 SE
250	25 In	NSX 630N 4P *	STR 23 SE
300	21 In	NSX 630N 4P *	STR 23 SE
400	16 In	NSX 800N 4P *	Micrologic 2.0
500	16 In	NSX 800N 4P *	Micrologic 5.0

The circuit breakers / switch-disconnectors recommended above respect the requirements for discrimination with the UPS fuses.
Depending on the installation, the CB/SD may be replaced by a CB/SD with a higher breaking capacity.
*** For short-circuit currents > 40 kA, use a CB/SD with a higher breaking capacity (type L or H).**

Recommended maximum downstream protection

If these recommendations are not followed, a short-circuit on an output circuit can result in a break in power longer than 20 ms on all the other output circuits.

UPS cabinets in kVA	CB/switch-disconnector	Trip unit
160 - 200	NSX 100N C120N C120N	TM D 63 C63 B 100
250 - 300	NSX 100N C120N C120N	TM D 80 C 80 B 125
400	NSX 100N NG 125N C 125H	TM D 100 C 125 C 125
500	C125N NSX 160N NG 125N	D 125 TM 160D D 125

Depending on the installation, the CB/SD may be replaced by a CB/SD with a higher breaking capacity.

These protective devices ensure discrimination for each circuit downstream of the UPS, with or without a bypass AC input.

Battery protection

UPS cabinets in kVA	Battery backup time at Pn	Battery CB/switch-disconnector QF1		
		Type	Trip unit	Magnetic setting in A
160	All	NS 400 or NS 630 DC	MP1	800
200	All	NS 400 or NS 630 DC	MP1	800
250	All	NS630 DC	MP1	1200
300	≤ 15 min > 15 min	NS630 DC C1251N DC	MP1 P21	1200 1600
400	≤ 5 min > 5 min	NS630 DC C1251N DC	MP1 P21	1200 1600
500	All	C1251N DC	P21	1600

Pn = rated power at a power factor of 0.9; for other values, please consult the after-sales support or the local office.
See the necessary precautions during connection of circuit breakers / switch-disconnectors in the installation manual of the battery circuit-breaker enclosure, doc. no. 34021529.

Recommended residual-current protection

Requirements for residual-current protection:

For common normal and bypass AC inputs:
- The same residual-current protection may be used for the two lines.

For separate normal and bypass AC inputs:
- A transformer is required upstream of either the normal AC line or the bypass AC line.
- Equip each line with a circuit breaker or switch-disconnector with residual current protection.

See “System earthing arrangements”, page 24.

The recommended minimum residual current protection is 3A, provided the conditions defined in IEC364.4-41 are respected.

1. Installation

Prerequisites >

Characteristics of the connection terminals

Connections are made to terminals that are pre-drilled or equipped with studs.
Earthing cables connect to the earthing bar.

UPS cabinets

Cabinets in kVA	Phase terminal		Earthing terminal	Battery terminal
	Type of stud	Hole diameter in mm	Hole diameter in mm	Hole diameter in mm
160 - 400	2 x M10 *	10	13	13
500	/	13	13	13

* Maximum tightening torque: 25 N.m

SSCs, SSC maintenance, External bypass cabinets

Cabinets in kVA	Phase terminal Hole diameter in mm	Earthing terminal Hole diameter in mm
800	13	13
1200	13	13
2000	13 and 17	13

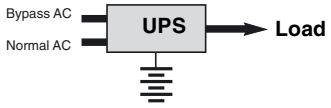
Power cables for single UPSs

AC cable sizes are determined for:

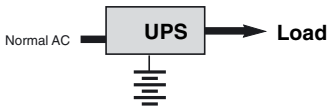
the TNS system for copper, single-core cables, type U1000 R02V, 100 m long with a line voltage drop <3%, installed on perforated cable trays, XLPE-type insulation, single-layer trefoil formation, THDI between 15% and 33%, 35°C, at 400V, grouped in four touching cables.

Battery cable sizes are determined for:
copper, single-core cables, type U1000 R02V, maximum length 25 m with a line voltage drop <1%.

General case



Frequency converter



UPS cabinets in kVA	Minimum size in mm²			
	Normal AC line	Bypass AC line	Load	Battery
160	1x95	1x95	1x95	1x95
200	1x120	1x120	1x120	1x120
250	1x150	1x150	1x150	1x150
300	1x240	1x240	1x240	1x185
400	2x150	2x150	2x150	1x240
500	2x240	2x240	2x240	2x150

Power cables for parallel UPSs

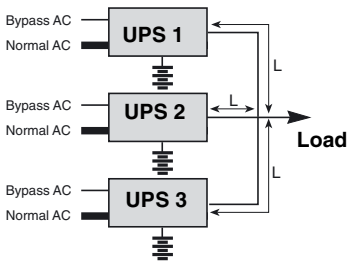
AC cable sizes are determined for:

the TNS system for copper, single-core cables, type U1000 R02V, 100 m long with a line voltage drop <3%, installed on perforated cable trays, XLPE-type insulation, single-layer trefoil formation, THDI between 15% and 33%, 35°C, at 400V, grouped in four touching cables.

Battery cable sizes are determined for:
copper, single-core cables, type U1000 R02V, maximum length 25 m with a line voltage drop <1%.

Important: For > 200 kVA UPSs, the output cables must be at least 6 metres long (L ≥ 6 m).

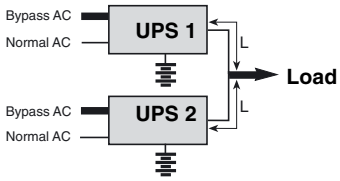
Normal AC line and battery



UPS cabinets in kVA	Minimum size in mm²	
	Normal AC line	Battery
160	1x95	1x95
200	1x120	1x120
250	1x150	1x150
300	1x240	1x185
400	2x150	1x240
500	2x240	2x150

Bypass AC line and load

Modular UPSs in parallel



UPS cabinets in kVA	Nbr of UPSs	Total power rating in kVA	Current on AC bypass or load in A	Min. size for AC bypass or load in mm²
160	2	160	231	1x95
200	2	200	289	1x120
250	2	250	361	1x150
300	2	300	433	1x240
400	2	400	577	2x150
500	2	500	722	2x240

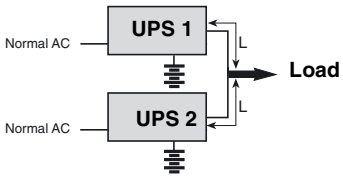
Power cables between the UPS units and the upstream protective devices must all be of the same size and length.
Power cables between the UPS units and the load must all be of the same size and length.

1. Installation

Prerequisites > Power cables for parallel UPSs

Important: For > 200 kVA UPSs, the output cables must be at least 6 metres long (L ≥ 6 m).

Frequency converters



UPS cabinets in kVA	Nbr of UPSs	Total power rating [1] in kVA	Load current in A	Minimum size for load in mm²
160	2	160	231	1x95
200	2	200	289	1x120
250	2	250	361	1x150
300	2	300	433	1x240
400	2	400	577	2x150
500	2	500	722	2x240

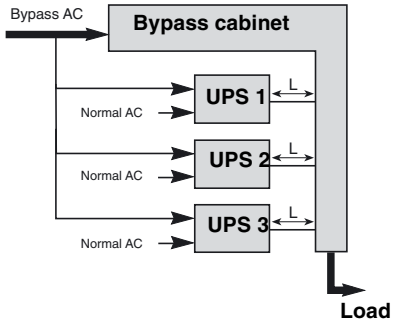
[1] Do not include redundant UPS units.

AC cable sizes are determined for:

the TNS system for copper, single-core cables, type U1000 R02V, 100 m long with a line voltage drop <3%, installed on perforated cable trays, XLPE-type insulation, single-layer trefoil formation, THDI between 15% and 33%, 35°C, at 400V, grouped in four touching cables.

Battery cable sizes are determined for:
copper, single-core cables, type U1000 R02V, maximum length 25 m with a line voltage drop <1%.

Modular UPSs in parallel with external bypass cabinet



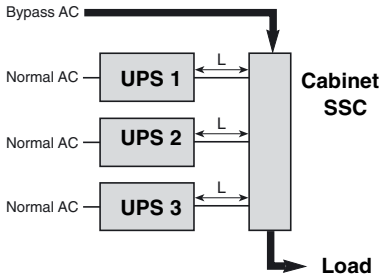
UPS cabinet in kVA	Nbr of UPSs	Total power rating [1] in kVA	Current on AC bypass or load in A	Min. size for AC bypass or load in mm²
160	2 3 4	320 480 640	462 693 923	2x95 2x185 2x240
200	2 3 4	400 600 800	578 866 1154	2x150 2x240 4x185
250	2 3 4	500 750 1000	722 1083 1443	2x185 3x300 4x240
300	2 3 4	600 900 1200	866 1300 1732	2x240 4x240 4x300
400	2 3 4	800 1200 1600	1154 1732 2308	4X185 4x300 4X500
500	2 3 4	1000 1500 2000	1433 2165 2886	4x240 4X500 Consult us[2]

[1] Do not include redundant UPS units.
[2] Standard NFC15-100 limits the number of cables to four.

Power cables between the UPS units and the upstream protective devices must all be of the same size and length.
Power cables between the UPS units and the load must all be of the same size and length.

Important: For > 200 kVA UPSs, the output cables must be at least 6 metres long (L ≥ 6 m).

Parallel UPSs with SSC (static-switch cabinet)



UPS cabinet in kVA	Nbr of UPSs	Total power rating [1] in kVA	Current on AC bypass or load in A	Min. size for AC bypass or load in mm²
250	2 3 4	500 750 1000	722 1083 1443	2x185 3x300 4x240
300	2 3 4	600 900 1200	866 1300 1732	2x240 4x240 4x300
400	2 3 4	800 1200 1600	1154 1732 2308	4x185 4x300 4X500
500	2 3 4	1000 1500 2000	1433 2165 2886	4x240 4X500 Consult us[2]

[1] Do not include redundant UPS units.
[2] Standard NFC15-100 limits the number of cables to four.

1. Installation

1.4 System earthing arrangements

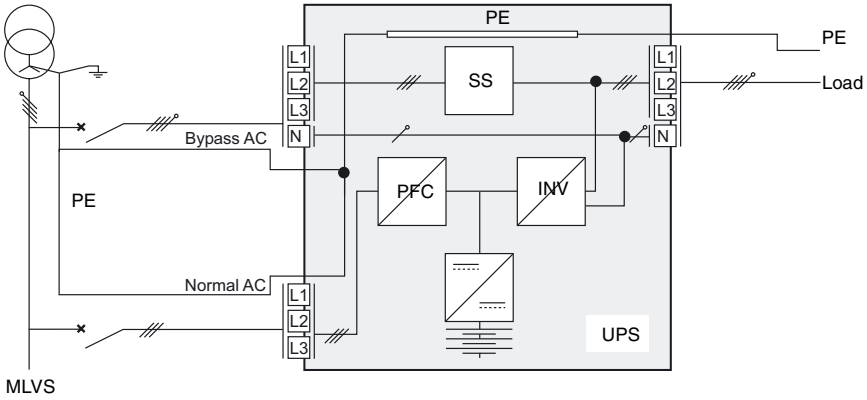
This section lists the main SEAs (system earthing arrangements) and their wiring requirements.
For SEAs not listed here, please contact the technical support department.

Single UPS

TNS upstream, TNS downstream

For separate normal and bypass AC lines from a single source.

Without residual-current protection:

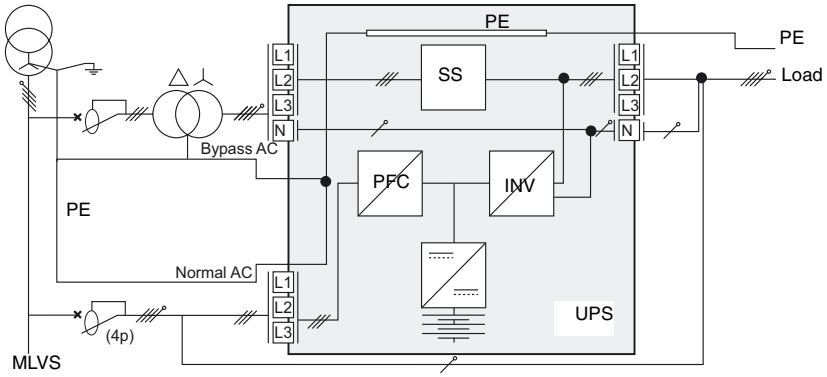


UPS units used as frequency converters: please contact your technical assistance.

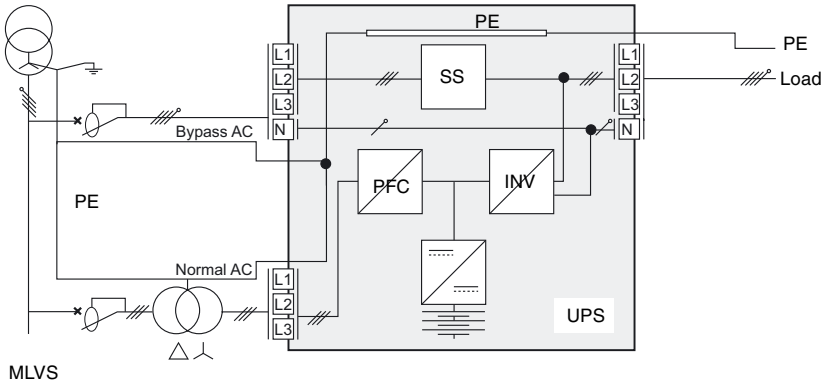
With residual-current protection:

Galvanic isolation between the normal and bypass AC lines is mandatory.
The recommended minimum residual current protection is 3A, provided the conditions defined in IEC364.4-41 are respected.

For a transformer on a Bypass AC network



For a transformer on a Normal AC network



Adding a transformer into the Normal AC network reduces the installation's overall efficiency.

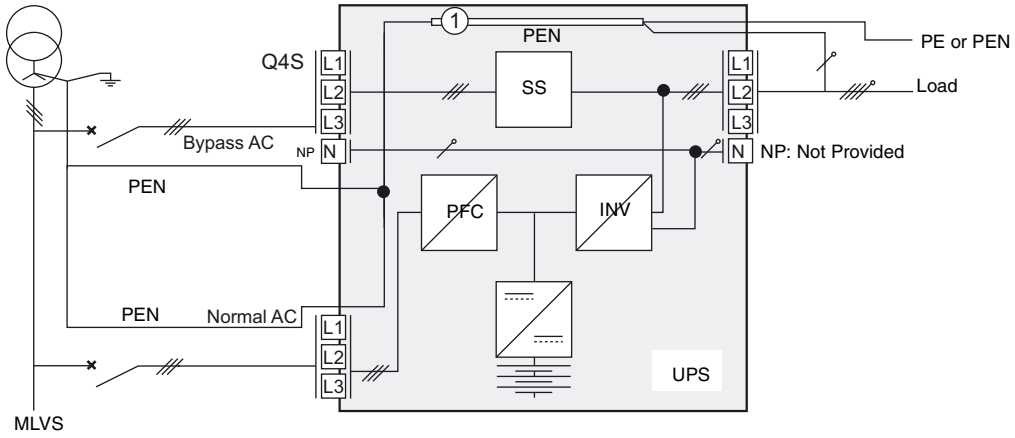
TNC upstream, TNC, TNS or TT downstream installation

For separate normal and bypass AC lines from a single source..

It is essential to transform the UPS internal PE bar into a PEN bar,See “Adapting the cabinet according to the neutral point connection”, page 26.
For an installation with a SSC cabinet or an external bypass cabinet, it is essential to transform the cabinet's internal PE bar into a PEN bar, See “Adapting the cabinet according to the neutral point connection”, page 26.

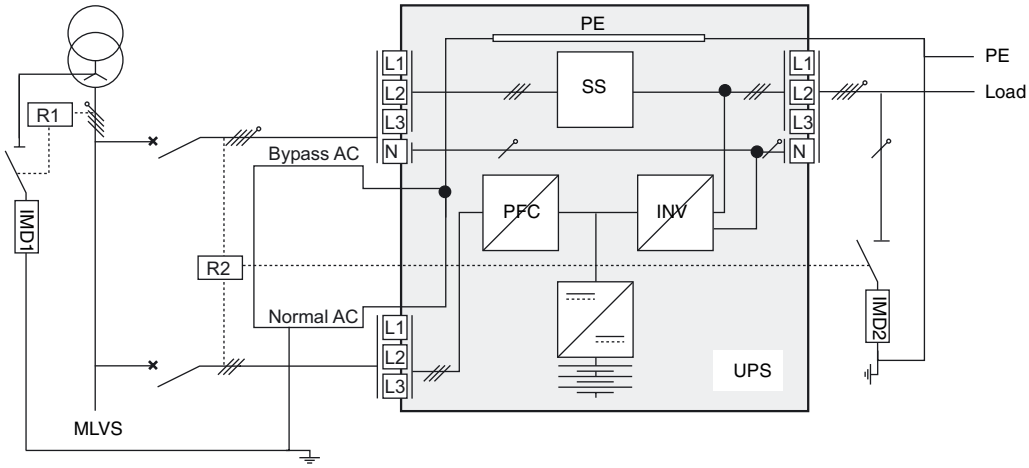
Unit or modular UPS:
The UPS output neutral must be connected to the internal PEN bar **(1)**.
Parallel UPSs with SSC cabinet or **modular UPSs with external bypass cabinet**:
The SSC cabinet output neutral or external bypass cabinet output neutral must be connected to the internal PEN bar for this cabinet.
The connection between the UPS outputs and the SSC cabinet or the external bypass cabinet must be done in TNC (connect the PEN cable to the PEN bar).

The load neutral terminal on the UPS, SSC or external bypass cabinet must not be used.
The SLT downstream TNS or TT starts on the MGE™ Galaxy™ 7000 installation output.



IT upstream, IT downstream

For separate normal and bypass AC lines from a single source..



In normal operating mode:
The IMD1 controls the whole installation, including downstream from the UPS. Power to the IMD2 is switched off by the R2 relay which controls voltage presence upstream from the UPS.

If the voltage is cut or the protection is opened upstream :
The R1 relay cuts the IMD1 circuit and the R2 relay closes the IMD2 circuit thus maintaining control downstream of the UPS.

Parallel UPS systems

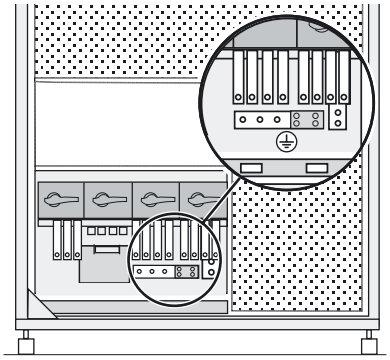
Earthing system adaptations are the same as those previously detailed for unitary UPS.

1.5 Adapting the cabinet according to the neutral point connection

UPS cabinet

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.
The protective covers must be removed.

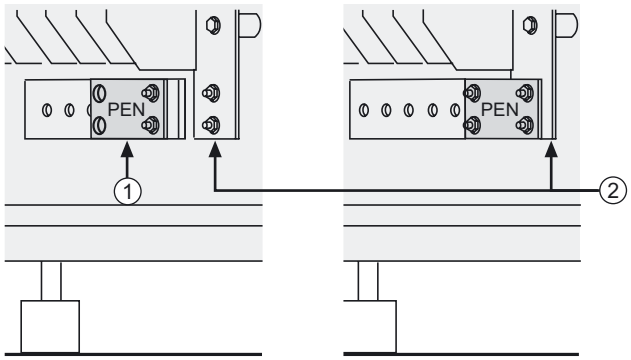


For IT, TNS or TT (PE) upstream system

1 - Disconnect and remove the joiner on the earthing bar**(1)**.

For TNC (PEN) upstream, TNC, TNS or TT downstream system

1 - Disconnect the joiner on the earthing bar **(1)**
2 - Install the joiner as shown opposite.

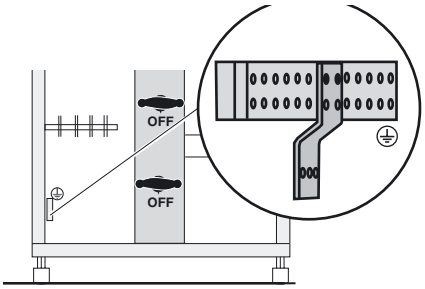


(2) Inverter neutral (N)

SSC cabinet or external bypass cabinet

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.
The protective covers must be removed.

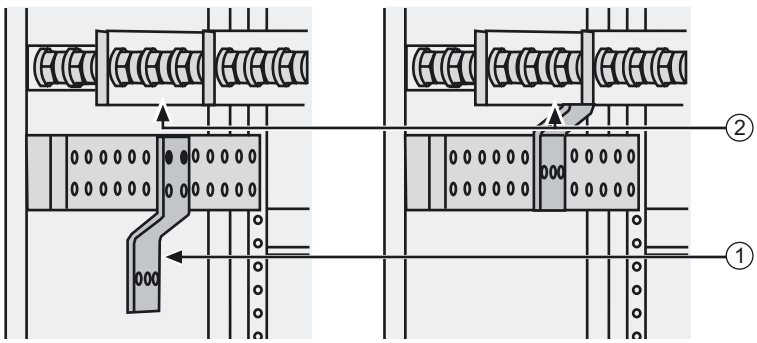


For IT, TNS or TT (PE) upstream system

1 - Disconnect and remove the joiner on the earthing bar **(1)** .

For TNC (PEN) upstream, TNC, TNS or TT downstream system

1 - Disconnect the joiner on the earthing bar **(1)**
2 - Install the joiner as shown opposite.



(2) SSC neutral (N)

1.6 Connecting the power cables

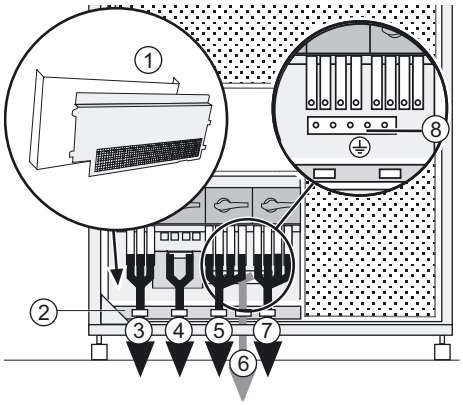
Dimensions are indicated in millimetres.
For parallel installations with no neutral on the load and the network, interconnect the UPS neutrals.

Single or modular UPS cabinet

160 to 400 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.
The door must be opened using the Ronis 405 key.



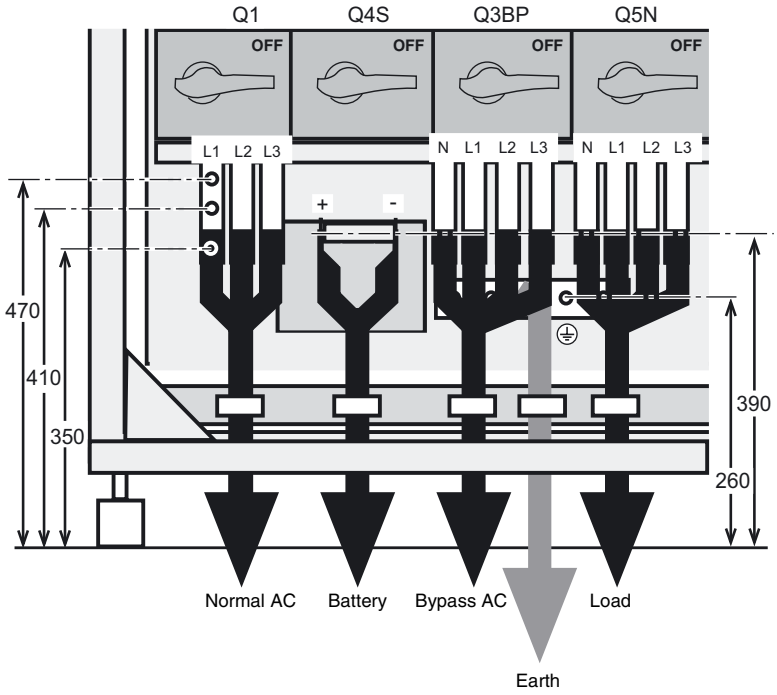
Key:

(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) To bypass AC line
(6) To the earth
(7) To the load
(8) Earthing bar

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.
See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1, Q4S, Q3BP and Q5N are in the OFF position as shown opposite.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Connect the battery

7 - Tie the cables down

8 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

9 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

1. Installation

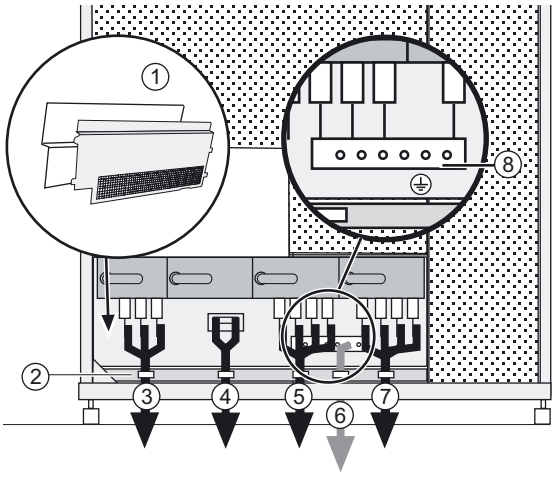
Connecting the power cables > Single or modular UPS cabinet

500 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

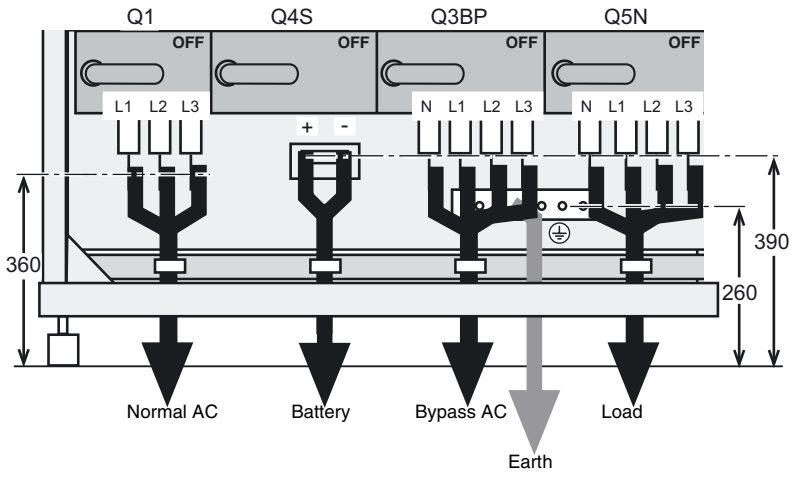
(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) To bypass AC line
(6) To the earth
(7) To the load
(8) Earthing bar

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1, Q4S, Q3BP and Q5N are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Connect the battery

7 - Tie the cables down

8 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

9 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

Frequency-converter cabinet

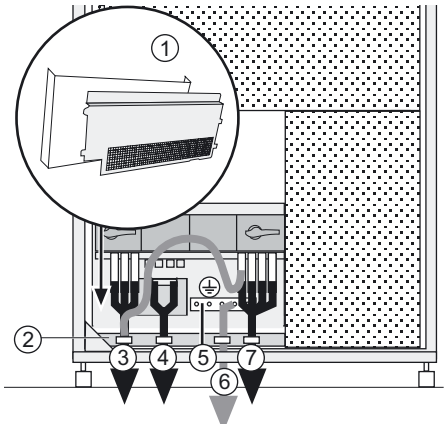
160 to 400 kVA

In parallel systems, switches Q4S and Q3BP are absent.

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

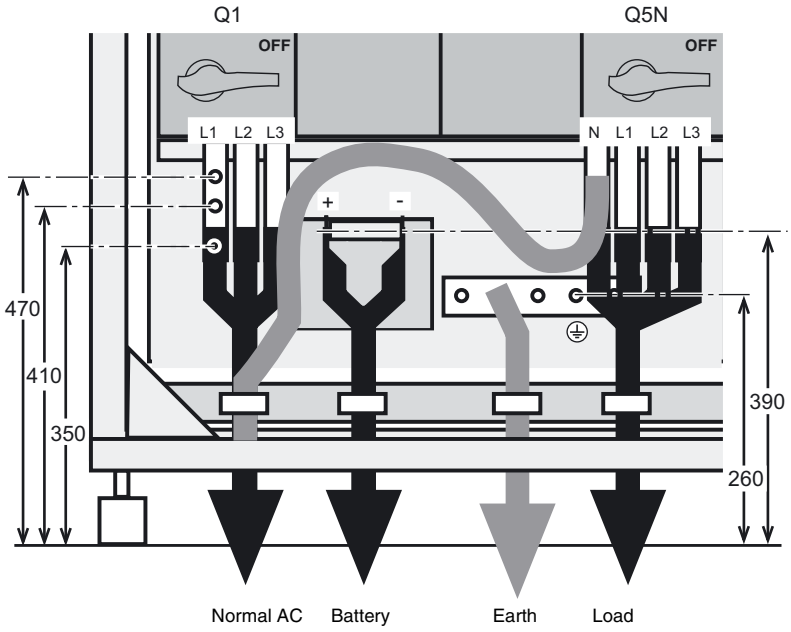
(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) Earthing bar
(6) To the earth
(7) To the load

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1 and Q5N are in the OFF position as shown opposite.

2 - Connect the normal AC neutral to the load neutral

3 - Connect the protective conductor (PE or PEN) to the earth bar

4 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Connect the battery

7 - Tie the cables down

8 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

9 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

1. Installation

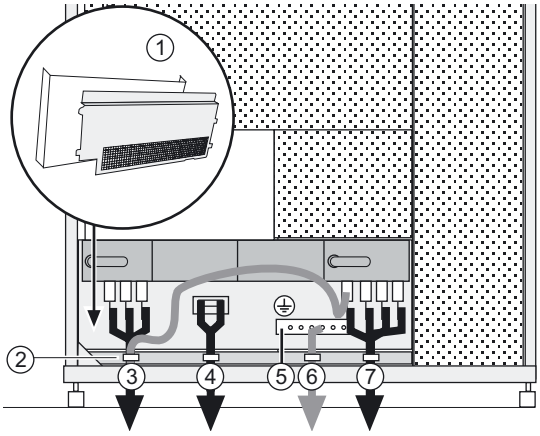
Connecting the power cables > Frequency-converter cabinet

500 kVA

In parallel systems with an SSC, switches Q4S and Q3BP are absent.
The bypass AC connection is made in the SSC.

Remove the protective covers

This operation must be carried out by qualified personnel.
The door must be opened using the Ronis 405 key.



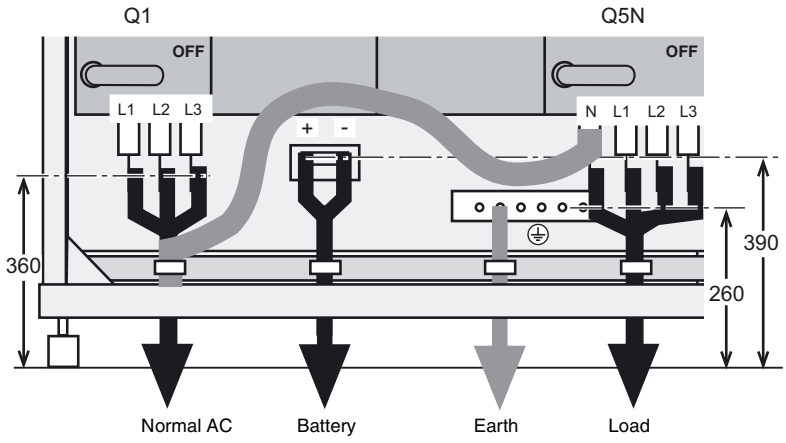
Key:

(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) Earthing bar
(6) To the earth
(7) To the load

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.
See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1 and Q5N are in the OFF position as shown opposite.

2 - Connect the normal AC neutral to the load neutral

3 - Connect the protective conductor (PE or PEN) to the earth bar

4 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Connect the battery

7 - Tie the cables down

8 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

9 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

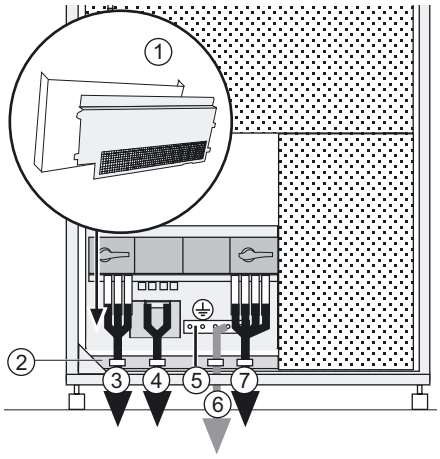
Parallel UPS cabinet

250 to 400 kVA

In parallel systems with an SSC, switches Q4S and Q3BP are absent.
The bypass AC connection is made in the SSC.

Remove the protective covers

This operation must be carried out by qualified personnel.
The door must be opened using the Ronis 405 key.



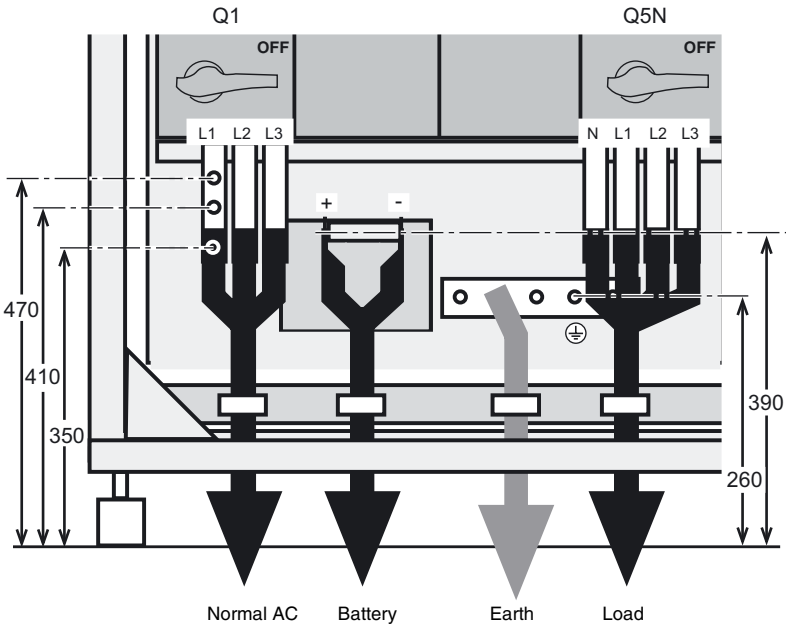
Key:

(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) Earthing bar
(6) To the earth
(7) To the load

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.
See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1 and Q5N are in the OFF position as shown opposite.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

4 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the battery

6 - Tie the cables down

7 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

8 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

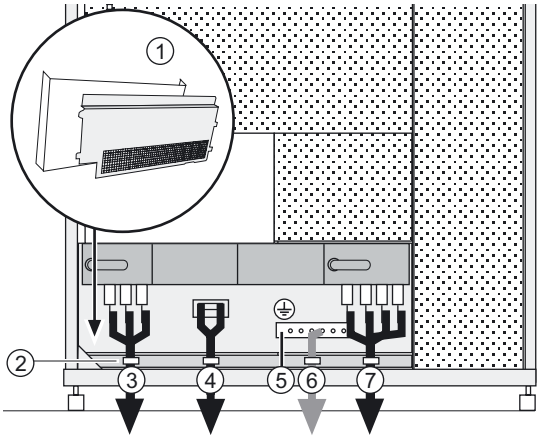
Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

500 kVA

In parallel systems with an SSC, switches Q4S and Q3BP are absent.
The bypass AC connection is made in the SSC.

Remove the protective covers

This operation must be carried out by qualified personnel.
The door must be opened using the Ronis 405 key.



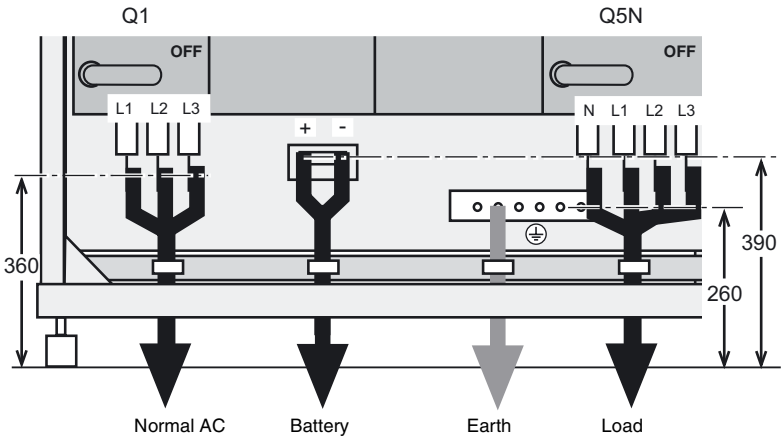
Key:

(1) Protective covers
(2) Tie bar
(3) To normal AC line
(4) To the batteries
(5) Earthing bar
(6) To the earth
(7) To the load

1 - Remove the protective covers **(1)**

Connecting the power cables

This operation must be carried out by qualified personnel.
See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q1 and Q5N are in the OFF position as shown opposite.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3

4 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the battery

6 - Tie the cables down

7 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

8 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

Connections through the top of the cabinets are possible using an auxiliary cabinet 400 mm wide.

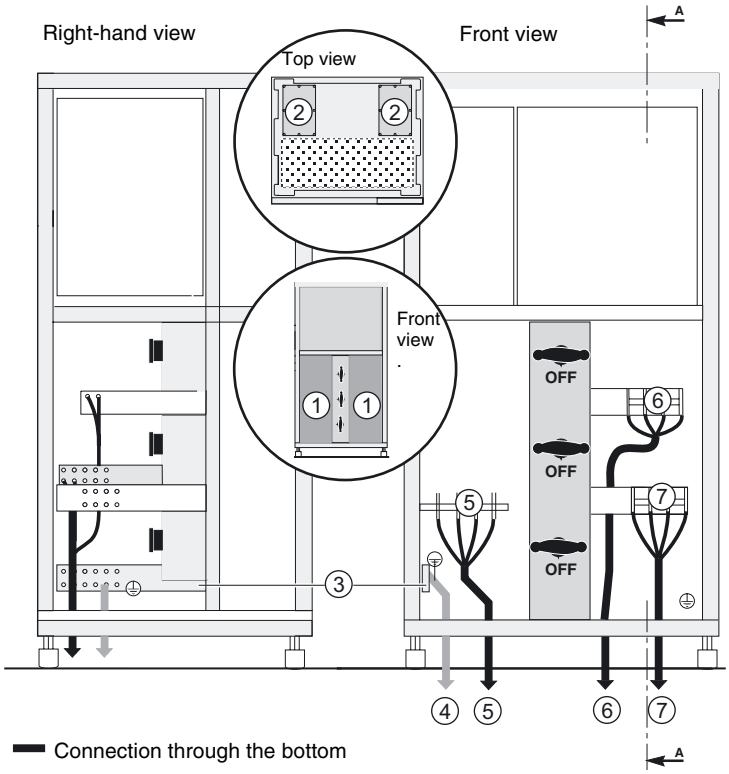
Static-switch cabinet

800 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block*
(6) To bypass AC line
(7) To the load

Connections through the top of the UPS cabinets are possible by using an auxiliary cabinet 400 mm wide.

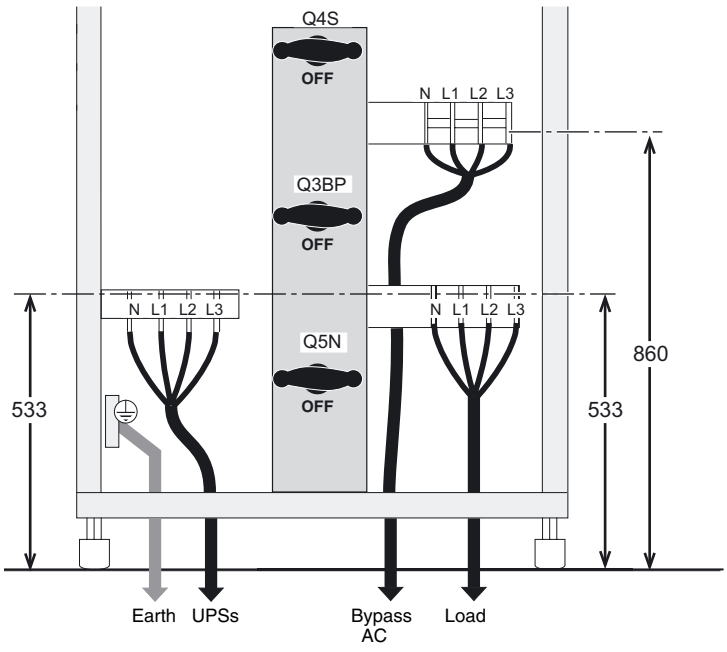
1 - Remove protective covers **(1)** and/ or **(2).**

* Or to the SSC maintenance cabinet; See “SSC maintenance cabinet”, page 42.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q4S, Q3BP and Q5N are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N**, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N**, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N**, L1, L2, L3

6 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

7 - Put the protective covers back in place.

** SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

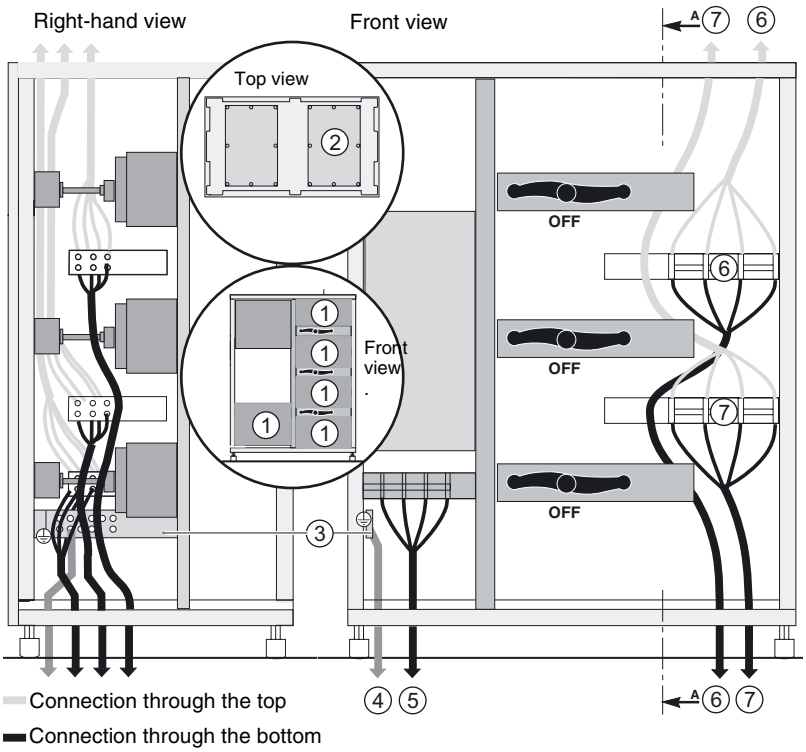
1. Installation

1200 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block*
(6) To bypass AC line
(7) To the load

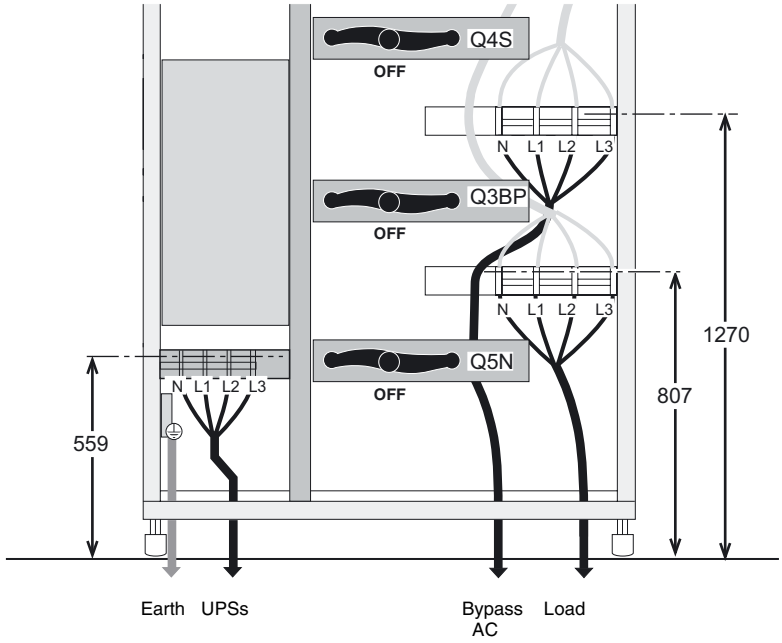
1 - Remove protective covers **(1)** and/ or **(2)**.

* Or to the SSC maintenance cabinet; See “SSC maintenance cabinet”, page 42.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q4S, Q3BP and Q5N are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N**, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N**, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N**, L1, L2, L3

6 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

7 - Put the protective covers back in place.

** SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

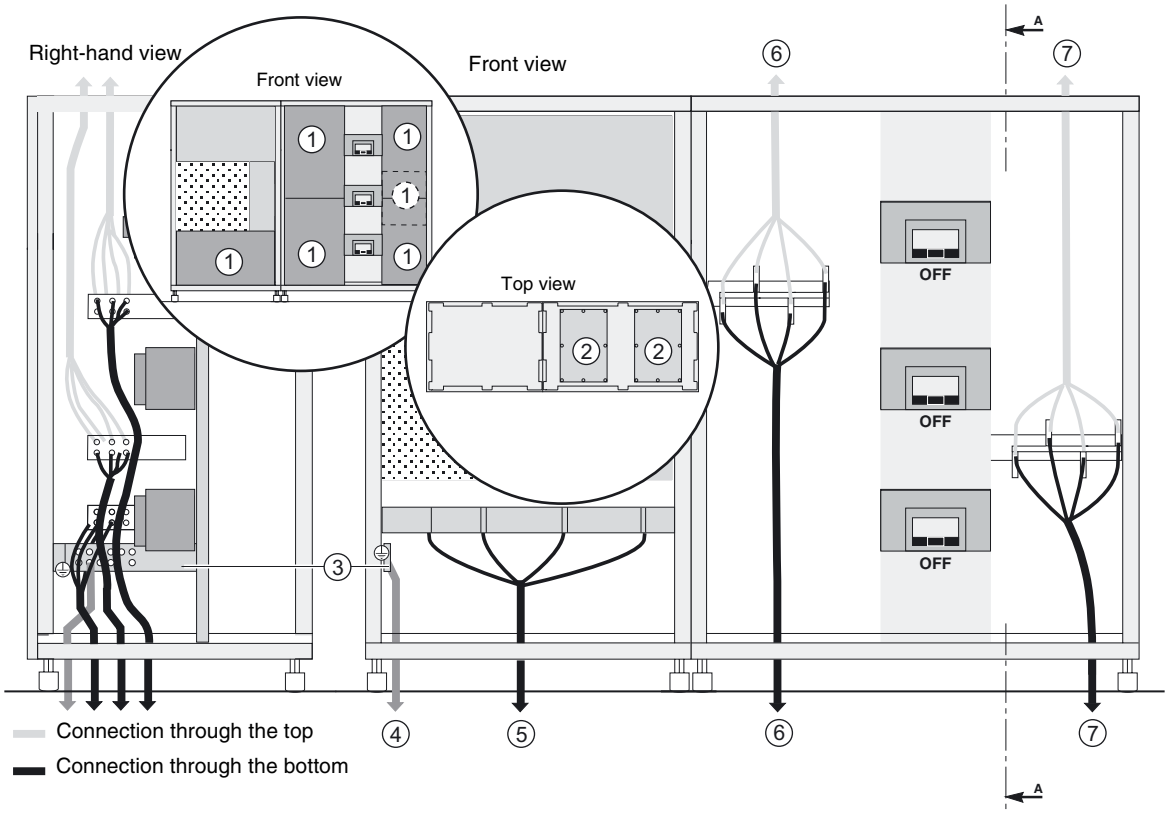
2000 kVA

You must have first assembled both cabinets, See “Assembling 2000 kVA SSCs”, page 61.

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block*
(6) To bypass AC line
(7) To the load

* Or to the SSC maintenance cabinet; See “SSC maintenance cabinet”, page 42.

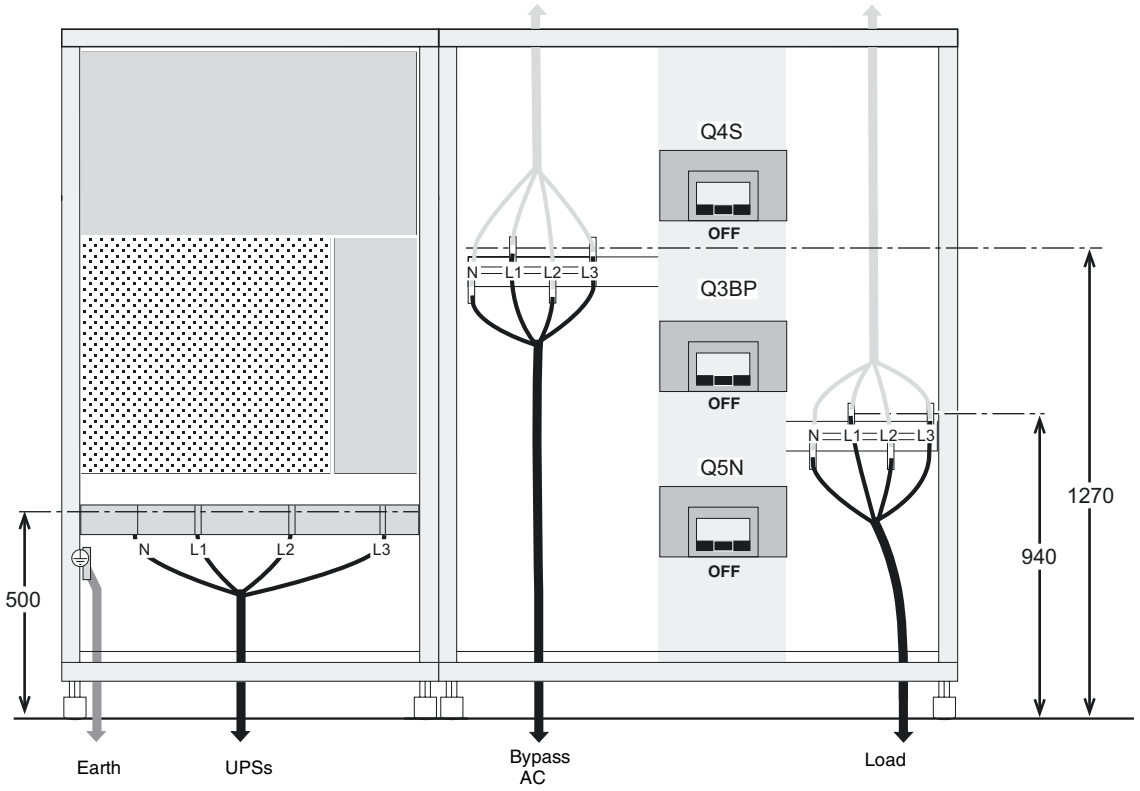
1 - Remove protective covers **(1)** and/or **(2)**.

1. Installation

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q4S **(1)**, Q3BP **(2)** and Q5N **(3)** are in the OFF position as shown above.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N*, L1, L2, L3

4 - Connect the AC Bypass conductors in the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Connect the control-wire cables (See “Connecting the control-wire cables”, page 46.)

7 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

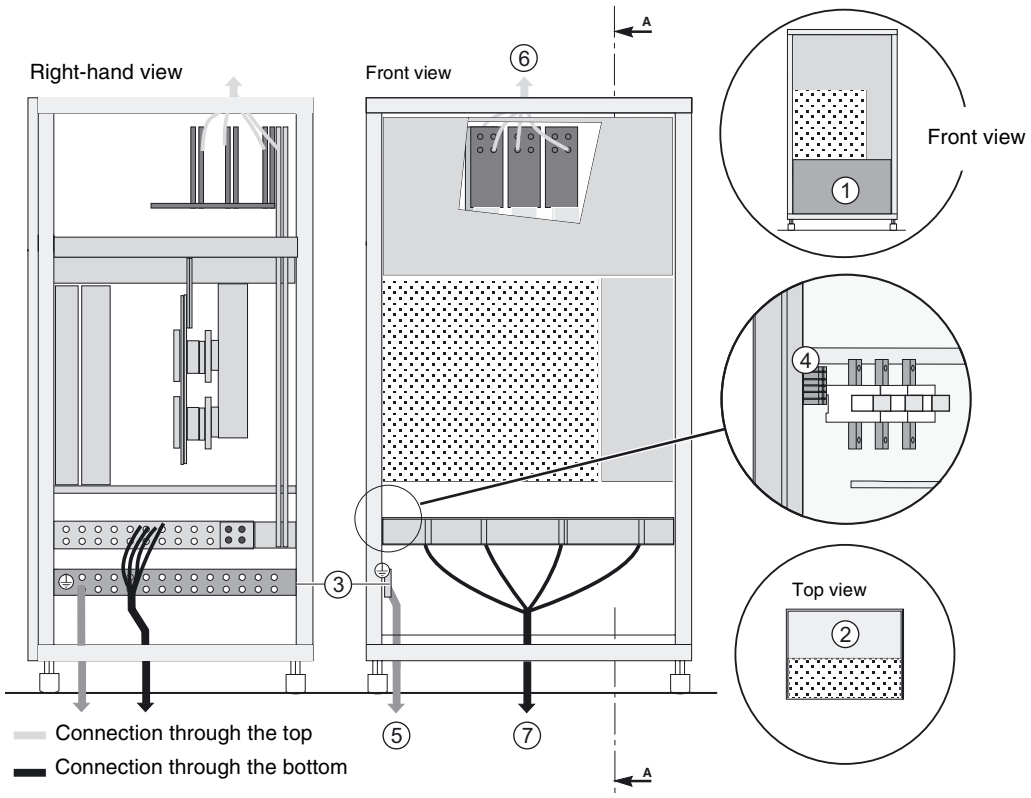
2000 kVA light

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.

The cabinet must be connected to the bypass AC line **exclusively** through the top using the busway. Consult us.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) UPS current sensor terminal block
(5) To the earth
(6) To bypass AC line (connection through the top)
(7) To the load (connection through the bottom)

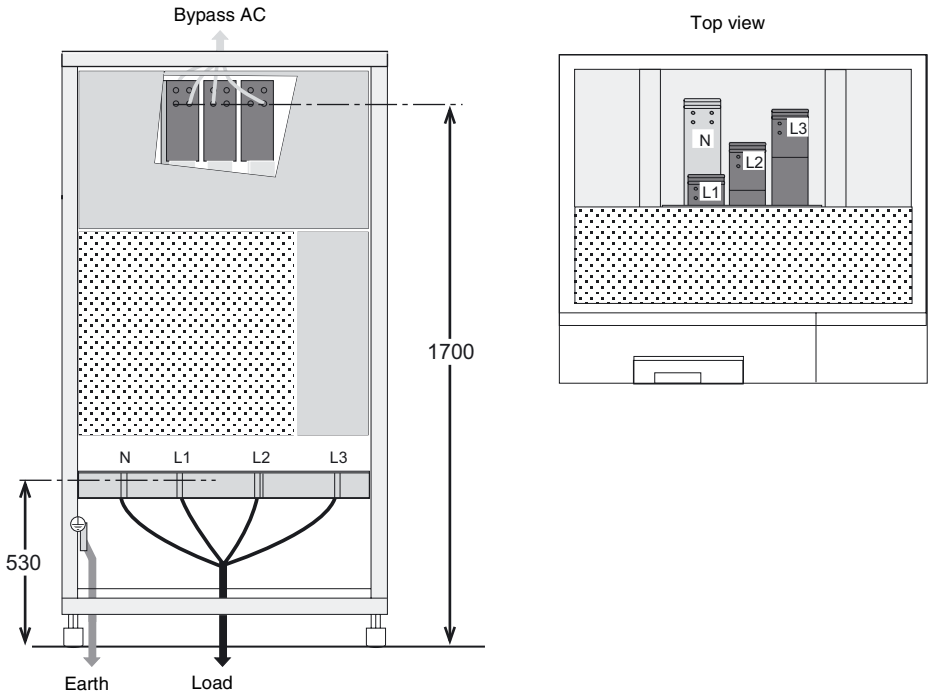
1 - Remove protective covers **(1)** and **(2)**.

1. Installation

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that customer switches Q4S, Q3BP and Q5N are in the OFF position

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the AC Bypass conductors in the following order: N*, L1, L2, L3

4 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the control-wire cables (See “Connect the components specific to the 2000 kVA light SSC”, page 50.)

6 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

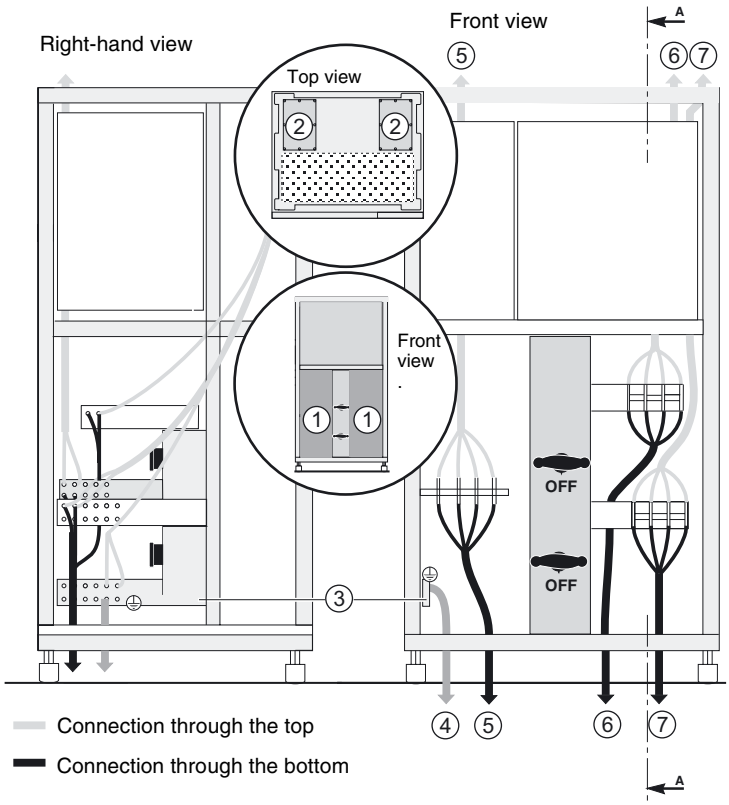
External bypass cabinet

800 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

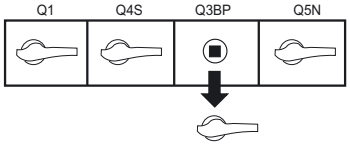
The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block
(6) To bypass AC line
(7) To the load

1 - Remove protective covers **(1)** and/ or **(2)**.

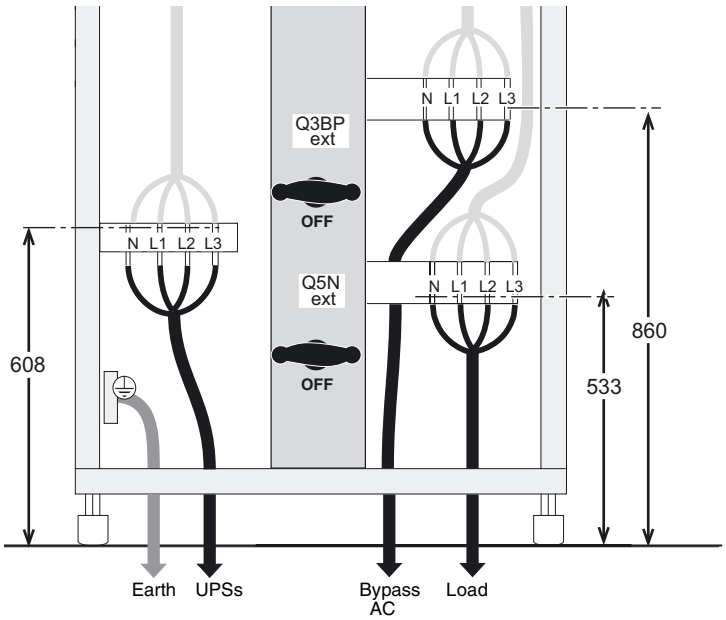


The handle of the Q3BP switch (in the OFF position) on all UPS units must be removed.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches , Q3BP ext and Q5N ext are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N*, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

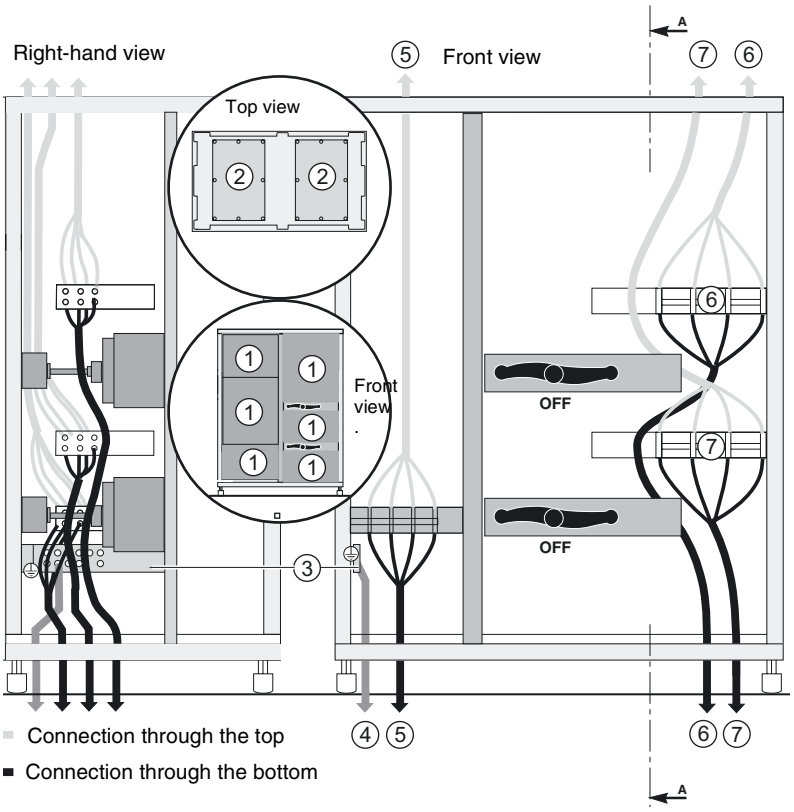
1. Installation

1200 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

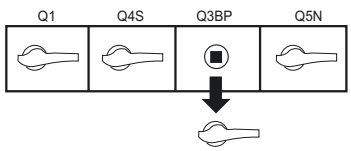
The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective cover
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block
(6) To bypass AC line
(7) To the load

1 - Remove protective covers **(1)** and/ or **(2)**.

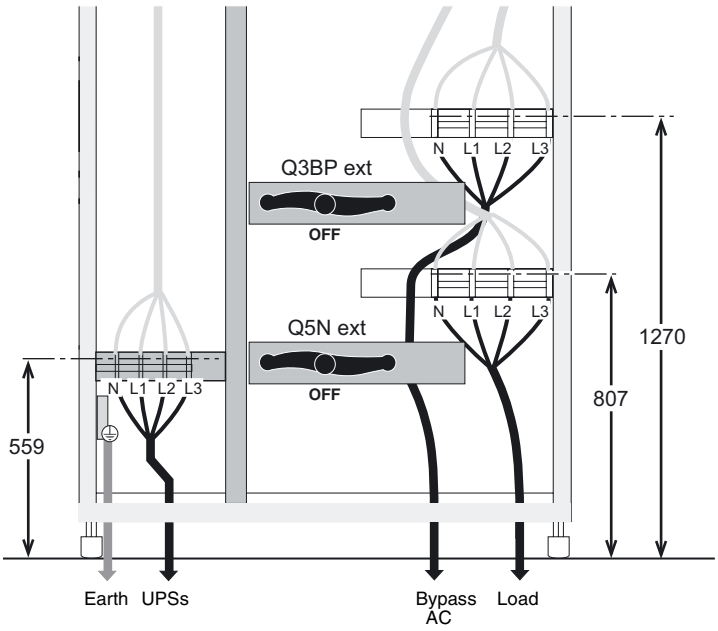


The handle of the Q3BP switch (in the OFF position) on all UPS units must be removed.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q3BP and ext Q5N ext are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N*, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Put the protective covers back in place.

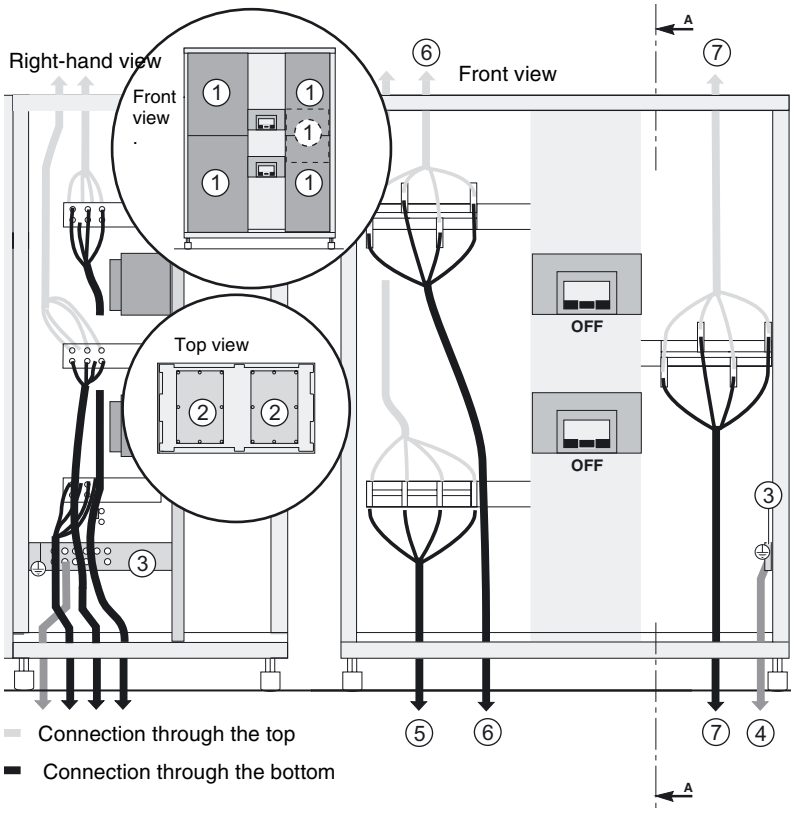
* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

2000 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

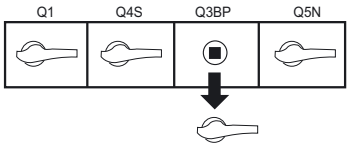
The door must be opened using the Ronis 405 key.



Key:

(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the UPS load terminal block
(6) To bypass AC line
(7) To the load

1 - Remove protective covers **(1)** and/or **(2)**.

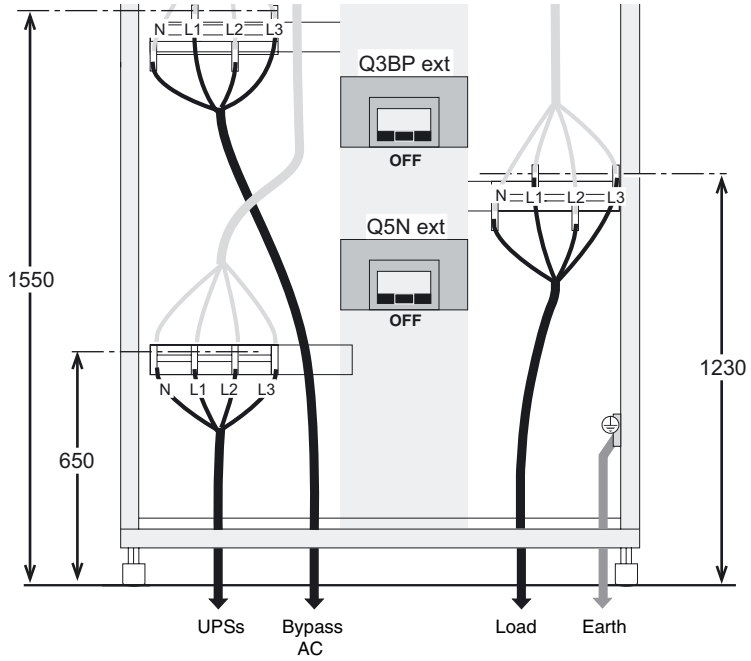


The handle of the Q3BP switch (in the OFF position) on all UPS units must be removed.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches Q3BP and ext Q5N ext are in the OFF position as shown opposite

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N*, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N*, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N*, L1, L2, L3

6 - Put the protective covers back in place.

* SLT upstream TNC, downstream TNC, TNS or TT, See “Adapting the cabinet according to the neutral point connection”, page 26.

1. Installation

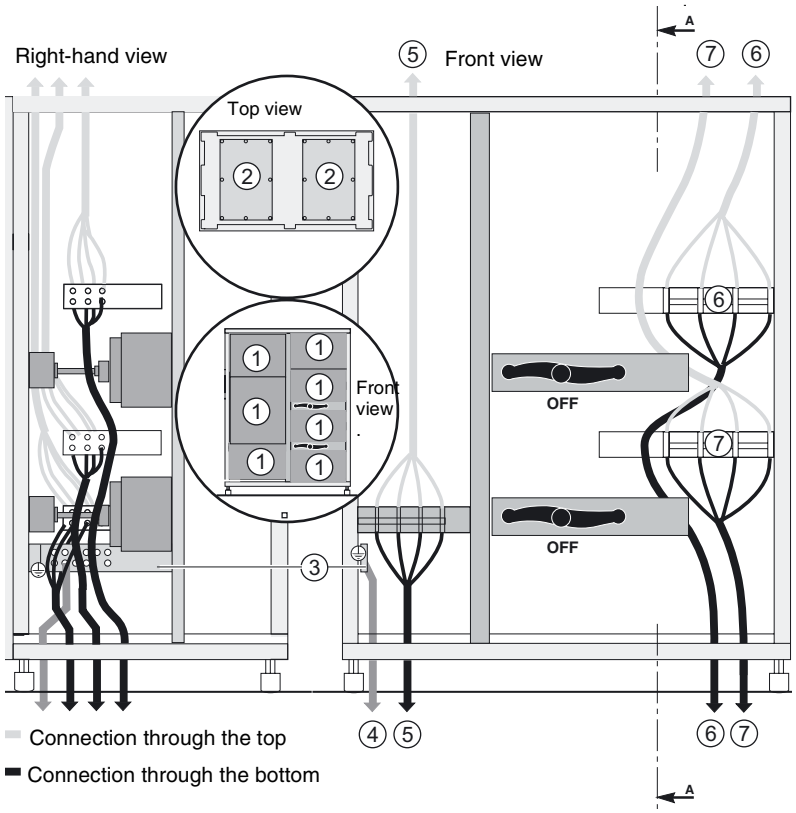
SSC maintenance cabinet

800 and 1200 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

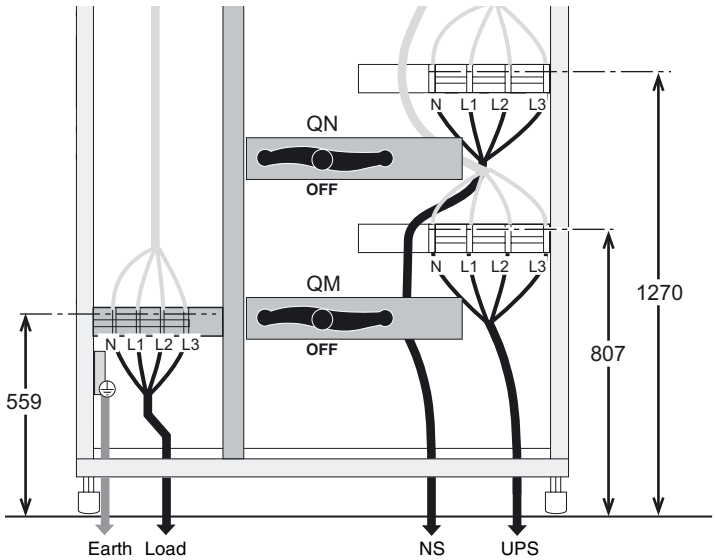
(1) Front protective covers
(2) Roof protective cover
(3) Earthing bar
(4) To the earth
(5) To the load
(6) To the SSC
(7) To the UPS load terminal block

1 - Remove protective covers **(1)** and/ or **(2)**.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches QN and QM are in the OFF position as shown opposite.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N, L1, L2, L3

4 - Connect the AC Bypass conductors in the following order: N, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N, L1, L2, L3

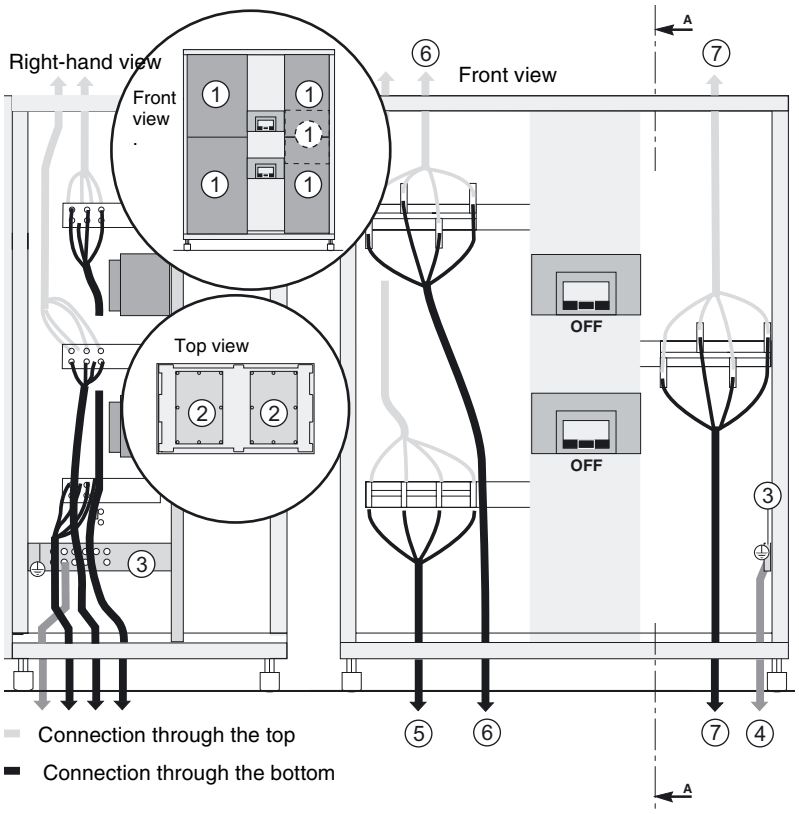
6 - Put the protective covers back in place.

2000 kVA

Remove the protective covers

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

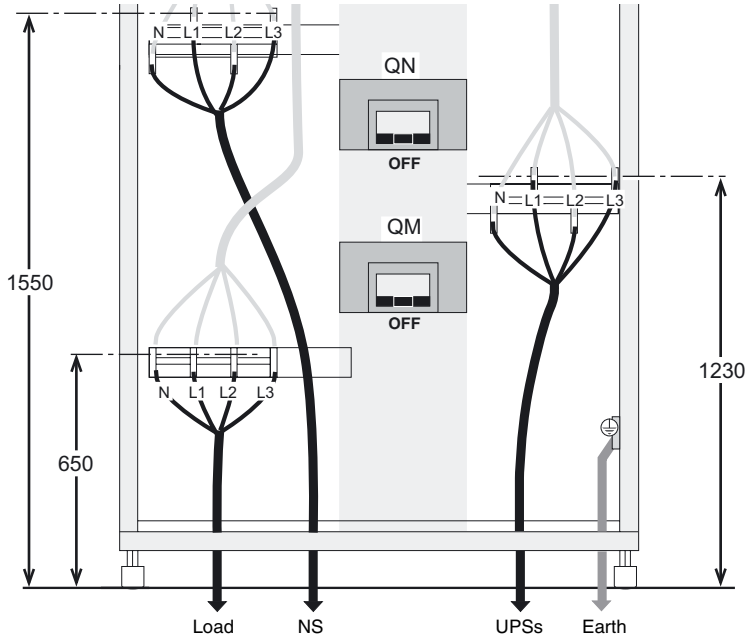
(1) Front protective covers
(2) Roof protective covers
(3) Earthing bar
(4) To the earth
(5) To the load
(6) To the SSC
(7) To the UPS load terminal block*

1 - Remove protective covers **(1)** and/ or **(2)**.

Connecting the power cables

This operation must be carried out by qualified personnel.

See “Characteristics of the connection terminals”, page 20.



1 -Check that switches , QN and QM are in the OFF position as shown opposite.

2 - Connect the protective conductor (PE or PEN) to the earth bar

3 - Connect the UPS conductors in the following order: N, L1, L2, L3

4 - Connect the bypass AC conductors taking care to respect the following order: N, L1, L2, L3

5 - Connect the load conductors taking care to respect the following order: N, L1, L2, L3

6 - Put the protective covers back in place.

1.7 Connecting cabinet ECPs (exposed conductive parts)

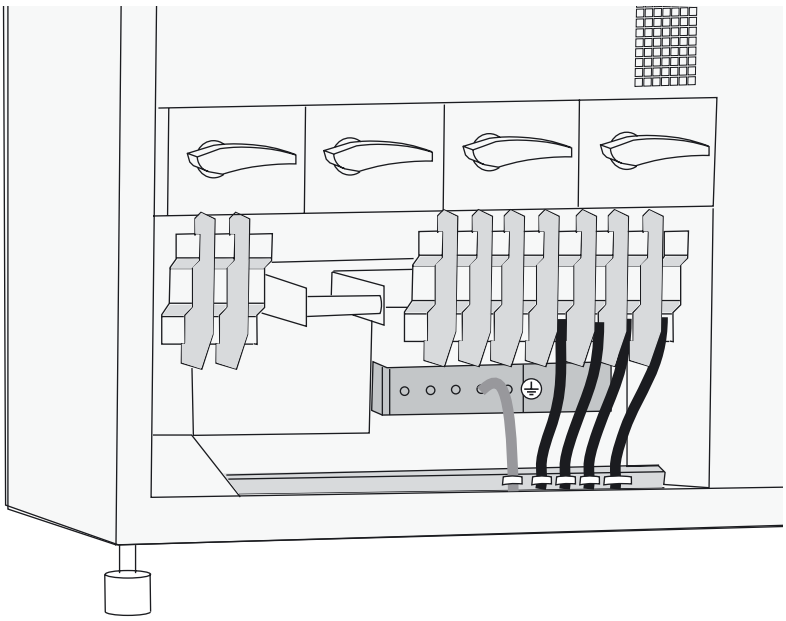
Valid for UPS, external bypass, SSC and battery cabinets

Interconnect the ECPs and tie down the wires

This operation must be carried out by qualified personnel.

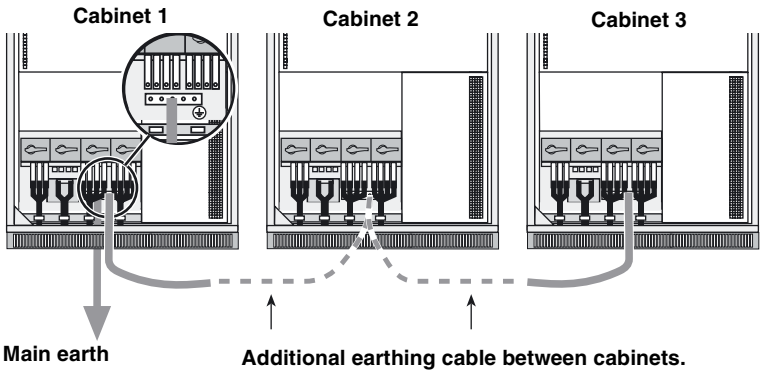
The door must be opened using the Ronis 405 key.

The protective covers must be removed.



1 - Connect the ECPs of all the cabinets in the installation using an additional earthing cable (not supplied) with the characteristics below:

- Minimum size is half that of a phase earthing conductor, same type of cable as for phase conductors.
- As short as possible.



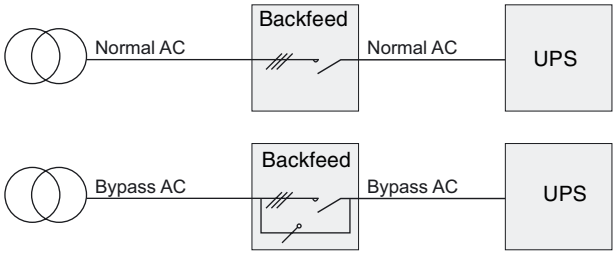
1.8 Connecting the synchronization module

Refer to the “synchronization module installation manual" no. 34000346.

1.9 Connect the backfeed option

The backfeed option on normal and bypass AC inputs is compulsory if IEC 62040-1-2 is to be complied with.

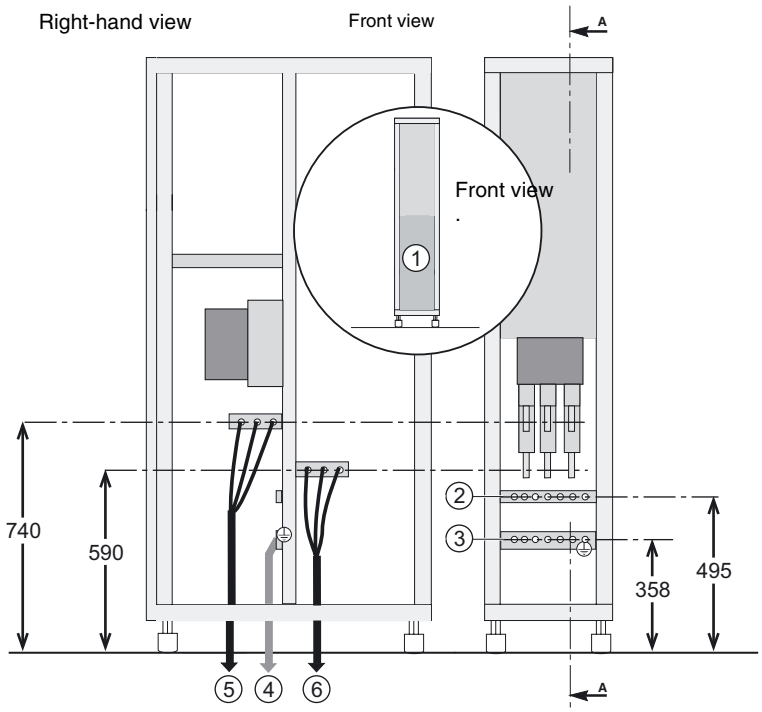
Block diagram



Connecting the power cables

This operation must be carried out by qualified personnel.

The door must be opened using the Ronis 405 key.



Key:

(1) Front face protective cover
(2) Neutral bar
(3) Earthing bar
(4) To the earth
(5) To normal or bypass AC line
(6) To the UPS

Diameter of backfeed cabinet connection terminal holes: 13 mm.

Connecting the Normal AC line backfeed cabinet

1 - Remove protective cover **(1)**
2 - Connect the protective conductor (PE or PEN) to the earth bar **(3)**
3 - Connect the normal AC conductors taking care to respect the following order: L1, L2, L3 **(6)**
4 - Connect the UPS conductors in the following order: L1, L2, L3 **(7)**
5 - Refit the protective cover

Connecting the Bypass AC line backfeed cabinet

1 - Remove protective cover **(1)**
2 - Connect the protective conductor (PE or PEN) to the earth bar **(3)**
3 - Connect the neutral conductor to the neutral bar **(2)**
4 - Connect the AC Bypass conductors in the following order: L1, L2, L3 **(6)**
5 - Connect the UPS conductors in the following order: L1, L2, L3 **(7)**
6 - Refit the protective cover

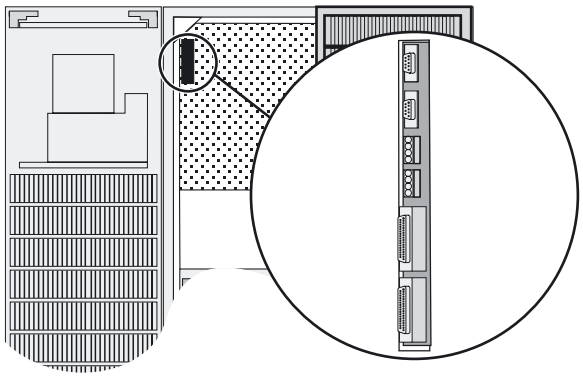
1.10 Connecting the control-wire cables

The maximum total length of CAN inter-cabinet cables must not exceed 180 m.

Connecting a modular UPS or frequency converter alone.

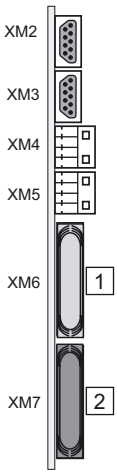
This operation must be carried out by qualified personnel.

The door must be open



Key:

(1) Connectors



1 - Fit a blue plug on connector XM6 in the UPS.
2 - Fit a red plug on connector XM7 in the UPS.

Connecting the UPS units in parallel

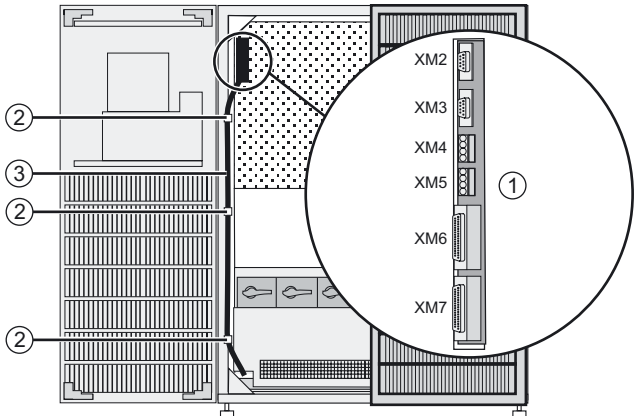
Connecting the modular UPS units in parallel

This operation must be carried out by qualified personnel.

The door must be open

The supplied cables are 10 m or 20 m long; the maximum total length must not exceed 180 m.

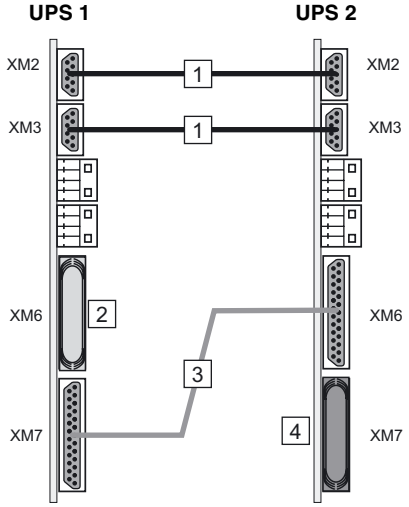
Once outside the cabinet, the cables must run along the earthing and connection cables between cabinets.



Key:

(1) Connectors
(2) Cable ties
(3) Exchange-current and CAN cables

Example for two UPSs



Exchange current:
1 - Connect the XM2 and XM3 connectors in the two UPS units.

CAN:
2 - Fit a blue plug on connector XM6 in UPS 1.
3 - Connect XM7 in UPS 1 to XM6 in UPS 2.
4 - Fit a red plug on connector XM7 in the UPS 2.

1. Installation

Connecting the modular UPSs with the external bypass

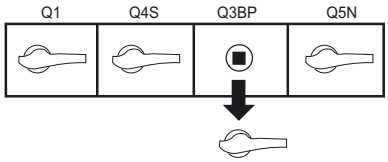
This operation must be carried out by qualified personnel.

The door must be open.

The supplied cables are 10 m or 20 m long; for oher lenghts, please consult us (the maximum total length must not exceed 180 m).

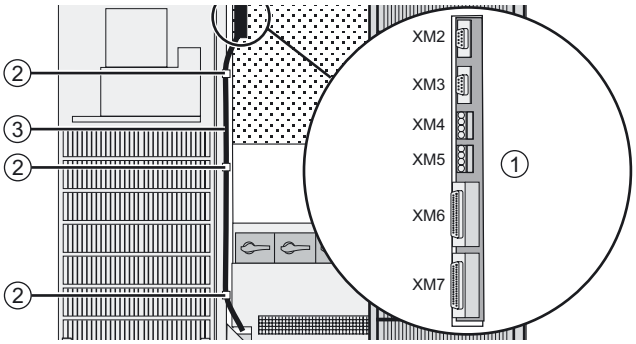
Auxiliary wires (exchange, CAN and bypass cabinet) and power cables must be separated to ensure sufficient insulation for the auxiliary wires.

Once outside the cabinet, the cables must follow the earth connections between the cabinets.



The handle of the Q3BP switch (in the OFF position) on all UPS units must be removed.

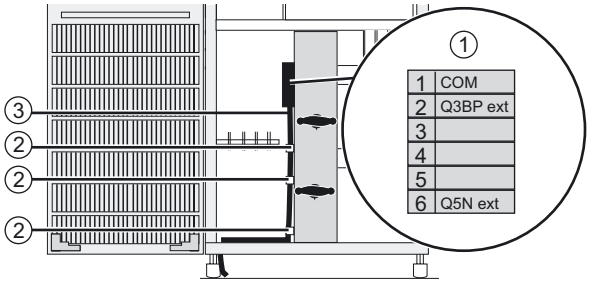
UPS cabinet



Key:

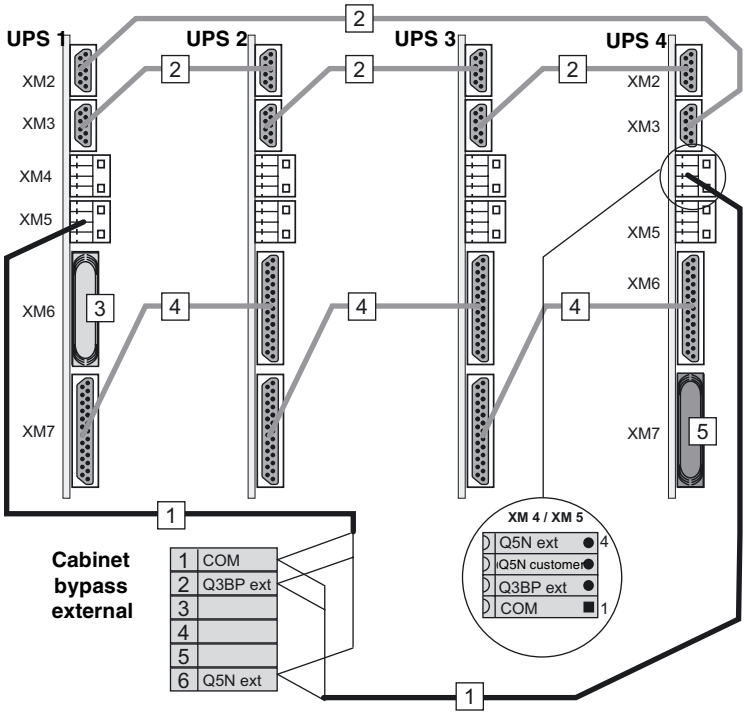
(1) Connectors
(2) Cable ties
(3) Exchange-current and CAN and control-wire cables

Bypass cabinet



Key:

(1) Connectors
(2) Cable ties
(3) Control-wire cables



Connection with bypass cabinet:

Control-wires:
0.5 to 1.5 mm² / AWG20 to AWG16
1 - Connect the common, Q3BP ext and Q5N ext terminals on the terminal block in the external bypass cabinet to connector XM4 in UPS 4 and XM5 in UPS 1 (cables not supplied)

Exchange current:
2 - Create a loop between XM2 and XM3 connectors in the four UPS units. All the connectors must be used.

CAN:
3 - Fit a blue plug on connector XM6 in UPS 1.
4 - Interconnect the XM6 and XM7 connectors in the four UPS units.
5 - Fit a red plug on connector XM7 in the UPS 4.

Connecting parallel UPSs with SSC (static-switch cabinet)

This operation must be carried out by qualified personnel.

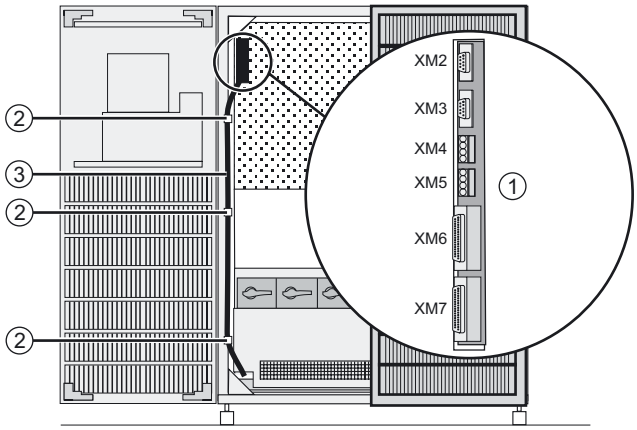
The door must be open.

The supplied cables are 10 m or 20 m long; the maximum total length must not exceed 180 m.

Auxiliary wires (exchange, CAN) and power cables must be separated to ensure sufficient insulation for the auxiliary wires.

Once outside the cabinet, the cables must run along the earthing and connection cables between cabinets.

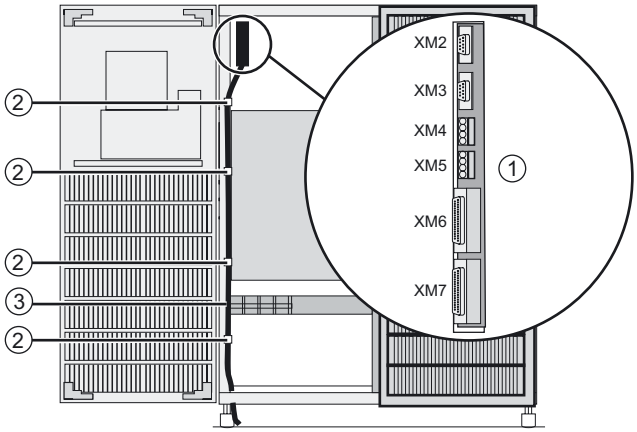
UPS cabinet



Key:

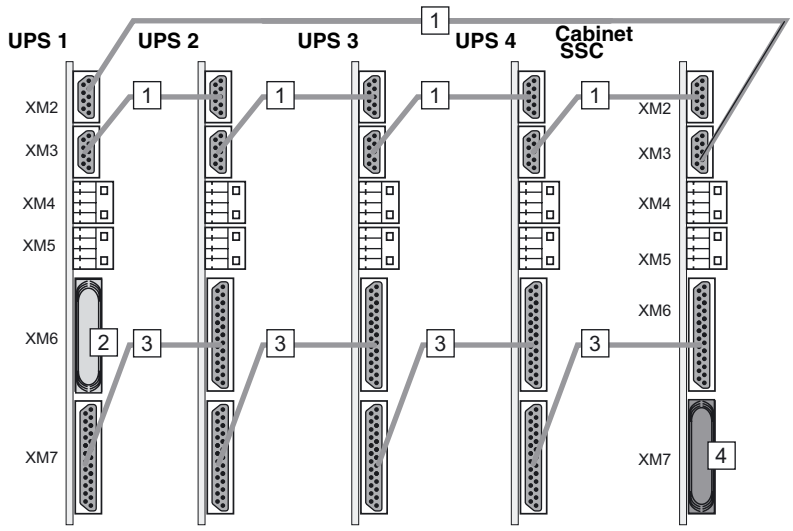
(1) Connectors
(2) Cable ties
(3) Exchange-current and CAN cables

SSC



Key:

(1) Connectors
(2) Cable ties
(3) Exchange-current and CAN cables



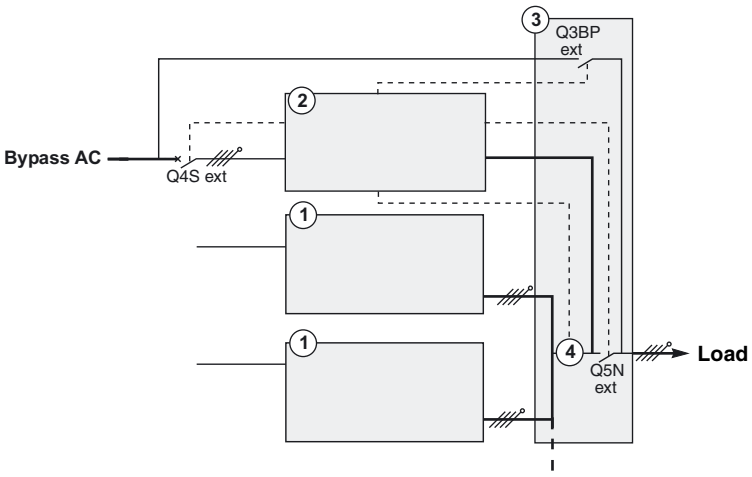
Exchange current:
1 - Create a loop between XM2 and XM3 connectors in the four UPS units and the SSC.
All the connectors must be used.

CAN:
2 - Fit a blue plug on connector XM6 in UPS 1.
3 - Interconnect the XM6 and XM7 connectors in the four UPS units and the SSC.
4 - Fit a red plug on connector XM7 in the SSC.

1. Installation

Connect the components specific to the 2000 kVA light SSC

Block diagram



UPS cabinet **(1)**
2000 light SSC **(2)**
Downstream coupling cabinet **(3)**
Customer current sensors **(4)**

Connect the customer current sensors

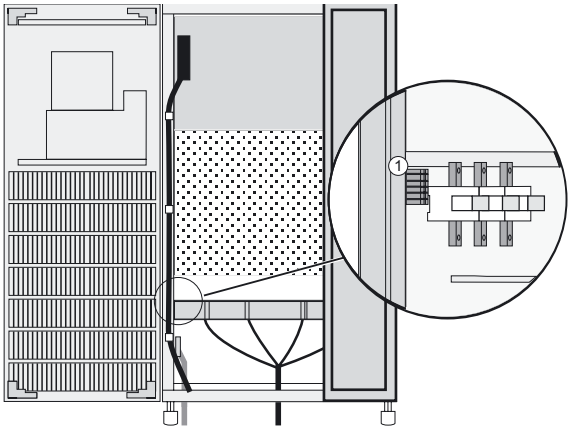
This operation must be carried out by qualified personnel.

The door must be open.

The cables (not supplied) must be **twisted pairs** of 0.8 to 1 mm² AWG18 gauge wire with a maximum length of 100 m.

Auxiliary wires (TI) and power cables must be separated to ensure sufficient insulation for the auxiliary wires.

Once outside the cabinet, the cables must follow the earth connections between the cabinets.



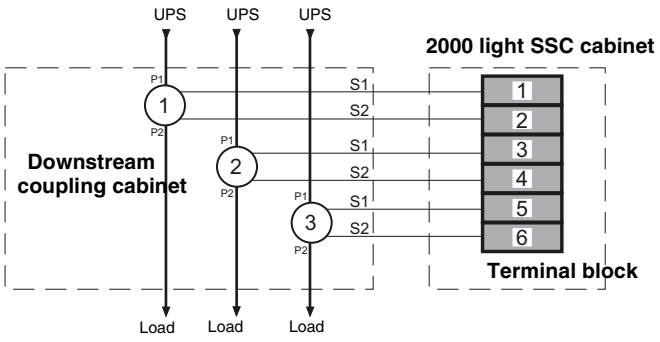
Key:

(1) UPS current sensor terminal block

Suitable current sensors must be used to ensure correct operation of the installation. Please contact your technical helpline to select the correct customer current sensors.

Recommendations: TI 4000/1, class 1, 10 VA.

Take care to respect polarity when wiring customer current sensors.



Key:

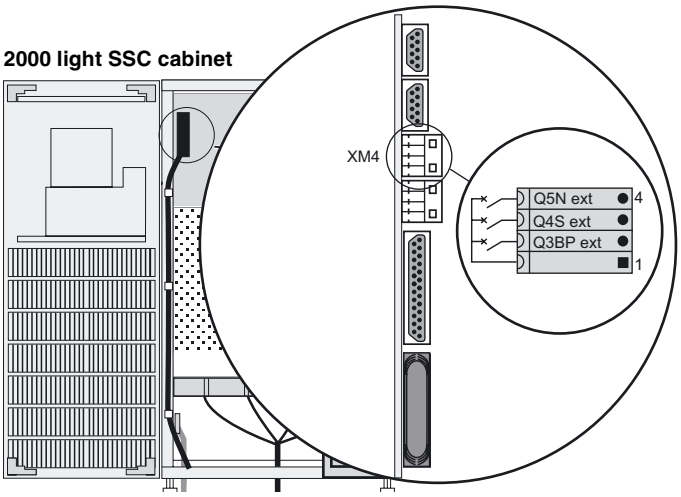
(1) Phase 1 customer current sensor
(2) Phase 2 customer current sensor
(3) Phase 3 customer current sensor

1 - Connect the terminal block connectors to the customer current sensors in the customer connection panel.

Connecting customer switches

For the installation to operate properly, the following must be respected:
Customer switches Q4S ext, Q3BP ext and Q5N ext must be electrically wired to behave like those of a SSC cabinet that contains switches.
The auxiliary contact of a customer switch must be a normally open contact when the switch is open.

2000 light SSC cabinet



Wire size:
0.5 to 1.5 mm² / AWG20 to AWG16

1 - Connect XM4 to switches Q5N ext, Q4S ext, Q3BP ext.

1. Installation

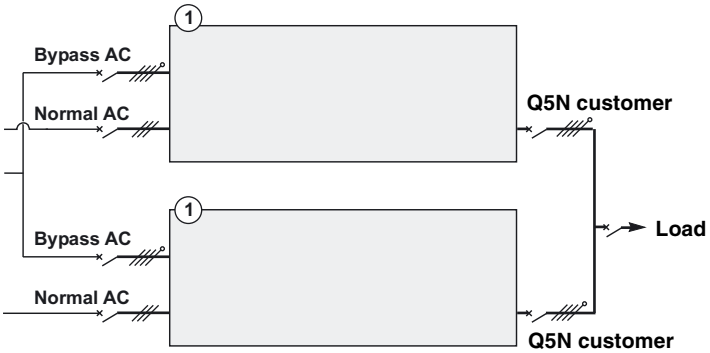
Connect the SSC maintenance cabinet

There are no auxiliary wire connections to be made on the SSC maintenance cabinet.

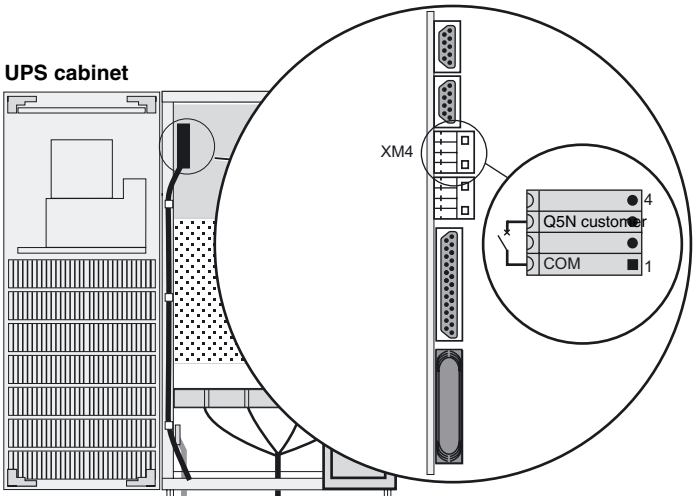
Connecting a customer Q5N

Not valid for single UPS or SSC cabinets.

For the installation to operate properly, the following must be respected:
There must be only one customer Q5N switch per UPS.
The auxiliary contact of a customer switch must be a normally open contact when the switch is open.



UPS cabinet **(1)**



1 - Connect XM4 to the customer Q5N switch.

Connecting the EPO function

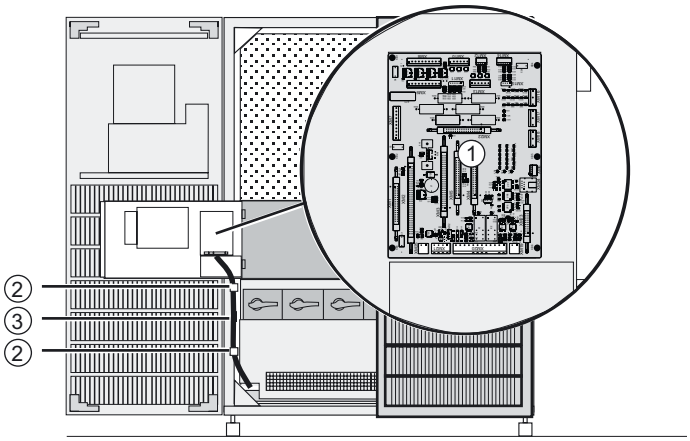
This operation must be carried out by qualified personnel.

The door must be open.

The **moving** door must be open.

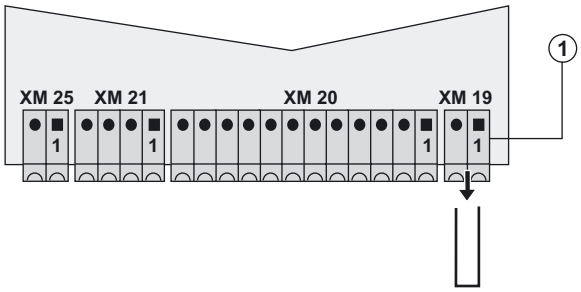
The cables (not supplied) must have SELV insulation and the maximum size is 2.5 mm².

To ensure sufficient isolation of control-wire (EPO) cables, they must be run separately from the power cables.



Key:

(1) Connectors
(2) Cable ties
(3) Cables



1 - Remove the jumper on the XM19 terminal block **(1)**.
2 - Connect the general shutdown NC contact to terminals 1 and 2 (SELV).
3 - Tie the cable down as illustrated.

Caution:
In the UPS or the SSC, the general shutdown causes UPS shutdown and the opening of the battery circuit breaker (without opening of the bypass static switch depending on the personalisation settings).
The Emergency Power Off (EPO) notion is applicable to installations where pressing the button also causes the circuit breakers on the upstream normal AC source and bypass AC source to open.
In parallel configurations, there must be a single general shutdown button with a separate contact for each UPS unit.

1. Installation

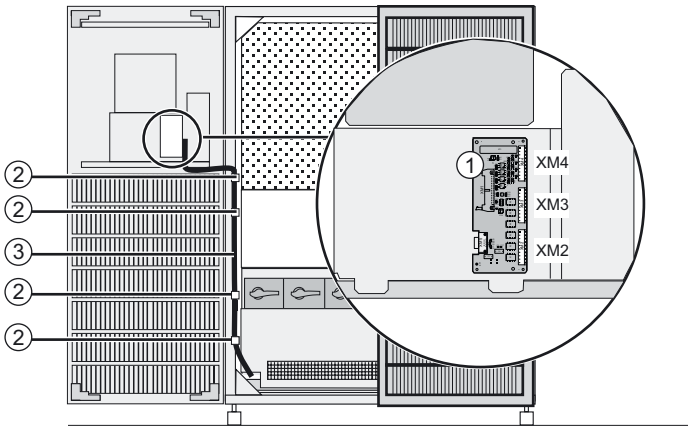
Connecting the dry-contact communication card

This operation must be carried out by qualified personnel.

The door must be open.

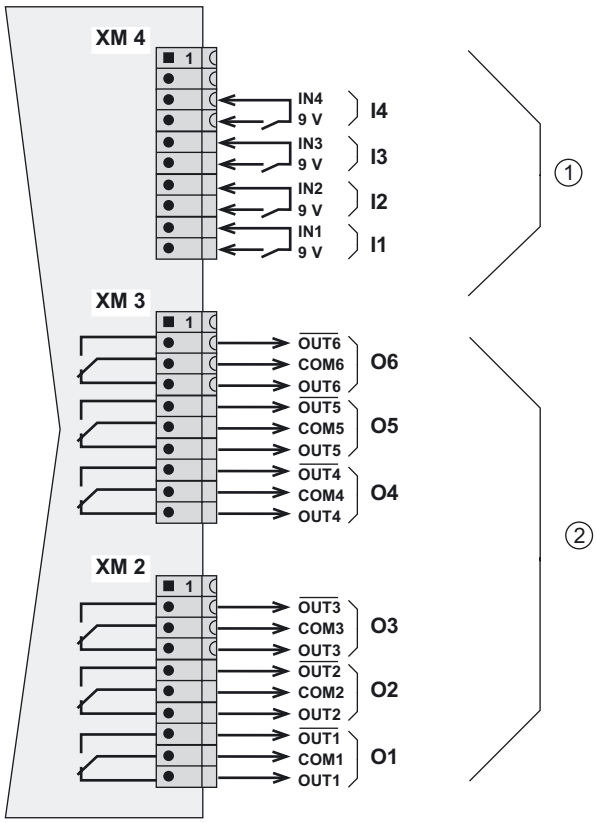
The cables (not supplied) must have SELV insulation.

To ensure sufficient isolation of control-wires (contact signal) cables, they must be run separately from the power cables.



Key:

(1) Connectors
(2) Cable ties
(3) Cables



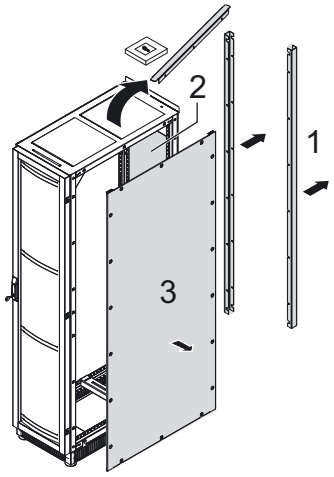
Maximum characteristics of input contacts (1) :
Switched voltage: 9 V DC (supplied by the UPS)
Consumption: 20 mA
Wire size:
0.5 to 1.5 mm² / AWG20 to AWG16

In installations with parallel devices, the input contacts must be unique and include a separate contact for each device.

Maximum characteristics of output contacts (2) :
Permissible voltage: SELV only
Permissible current: 1 A at 30 V DC
Wire size:
0.5 to 1.5 mm² / AWG20 to AWG16

The dry contacts can be configured; see "Dry-contact parameters" in the user manual no. 3402084700.

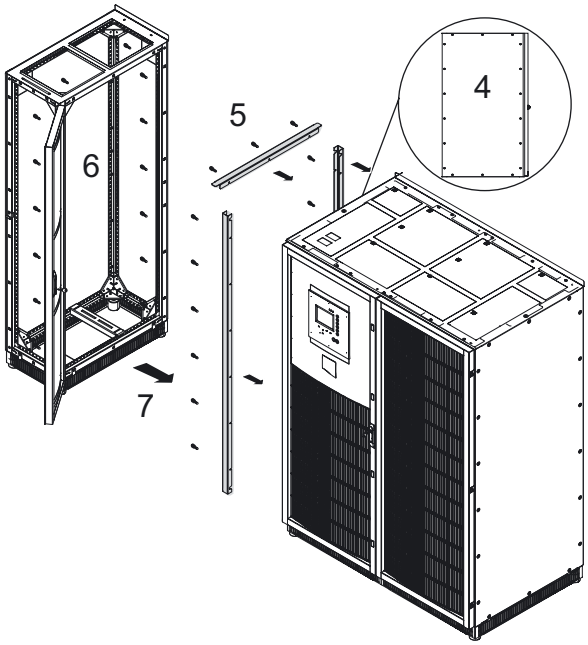
1.11 Coupling the 400 mm auxiliary cabinet



1 - Remove the two inter-cabinet uprights located behind the 400 mm cabinet.

2 - Refit the rear panel on the 400 cabinet with the supplied screws

3 - Remove the side panel on the 400 mm cabinet

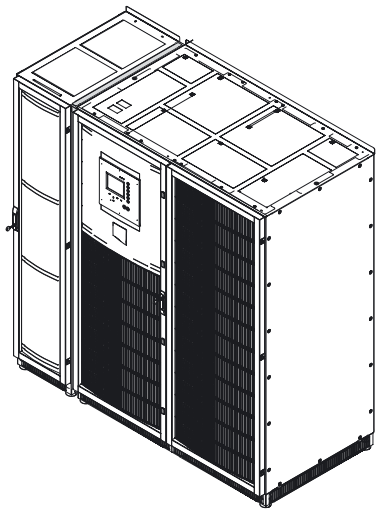


4 - Unscrew the side panel of the cabinet to be coupled without removing it

5 - Place the three inter-cabinet uprights above the side panel of the cabinet to be coupled

6 - Place the screws on the 400 mm cabinet

7 - Couple the 400 mm cabinet with the cabinet to be coupled and tighten the screws from inside the 400 mm cabinet.

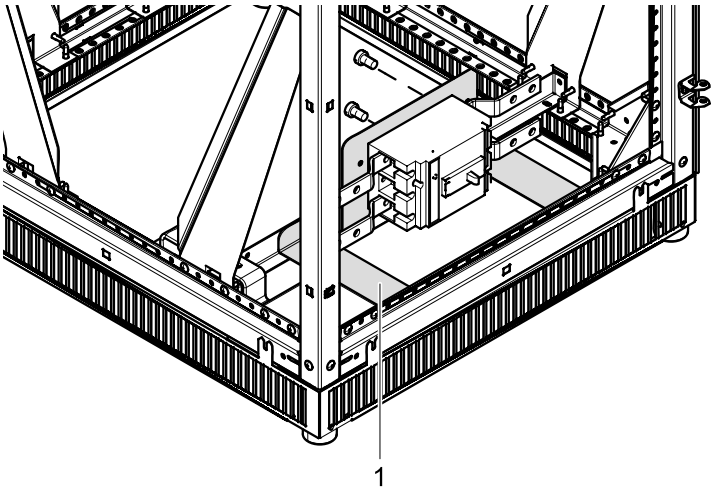


1.12 Assembling and connecting the external battery cabinet

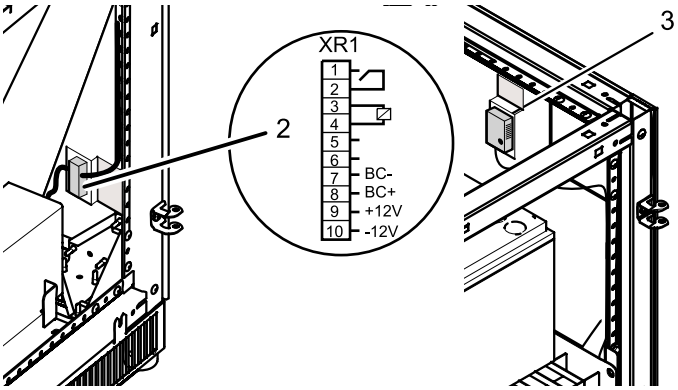
Assembling the empty battery cabinet

Mounting the battery circuit-breaker kit

Please contact our Sales department when selecting the battery circuit breaker.
Only one circuit breaker is necessary even if there are several battery cabinets.



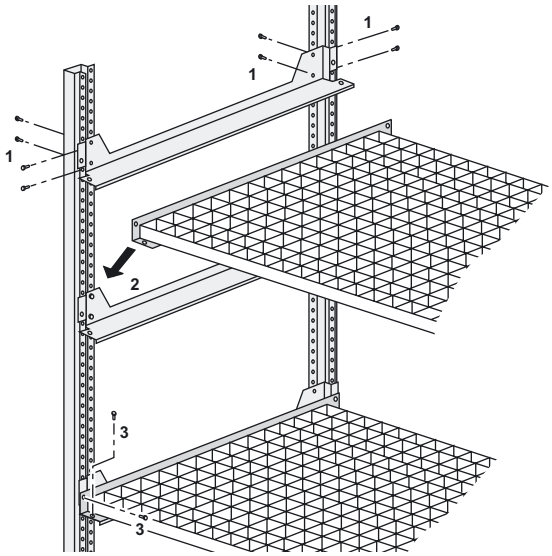
1 - Secure the plate



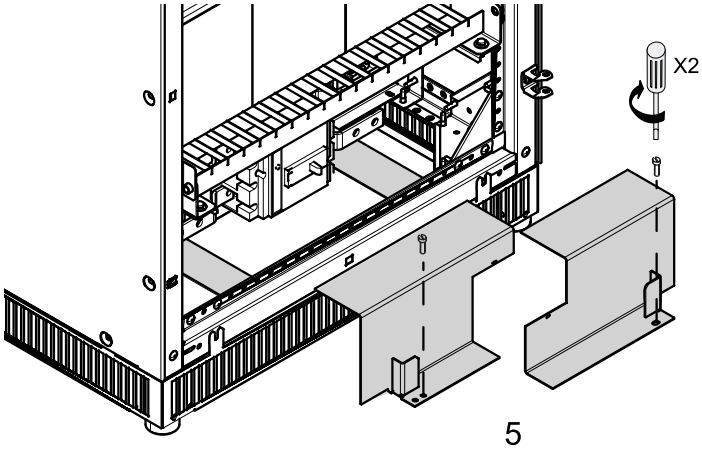
2 - Secure connector XR1
3 - Secure the temperature sensor.

Mounting the shelves

Assembly of the battery cabinet must be carried out by certified personnel (standard EN 50091-1-2).
The minimum clearance between the top of the battery cells and the next shelf is 150 mm.



1 - Secure the corner supports (6 screws per support).
2 - Install the shelf
3 - Secure the shelf with two screws in each corner.



5

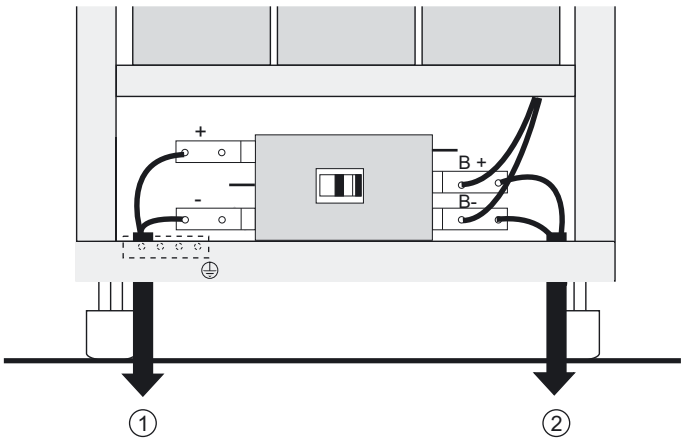
4 - Connect the control-wire cables, (See “Connecting the control-wire cables”, page 58.)

5 - Secure the protective cover after connecting the batteries to the circuit breaker.

Connecting the power cables

This operation must be carried out by qualified personnel.

The door must be open
The protective cover must be removed.
The battery circuit breaker must be open.



Key:

(1) To the UPS cabinet
(2) To the battery or auxiliary battery cabinet 2

1 - Connect the earthing conductor to the earthing bar in the battery cabinet **(1)**
2 - Connect the positive conductor (+) to the positive terminal
3 - Connect the negative conductor (+) to the negative terminal
4 - Secure the protective cover after connecting the batteries to the circuit breaker.

For more information, see the "Battery circuit-breaker kit" installation manual no. 34021530.

1. Installation

Connecting the control-wire cables

Connecting the battery circuit-breaker

This operation must be carried out by qualified personnel.

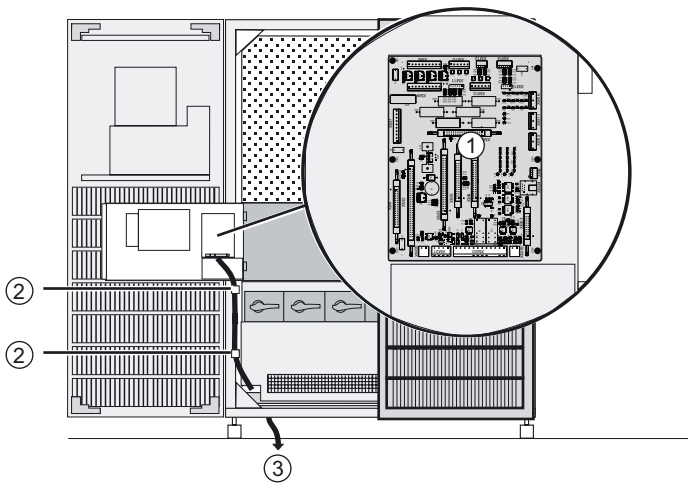
The UPS door must be open.

The **moving** door of the UPS must be open.

The cables (not supplied) must have SELV insulation, with size 0.5 to 1.5 mm² / AWG20 to AWG16.

To ensure sufficient isolation of control-wire cables, they must be run separately from the power cables.

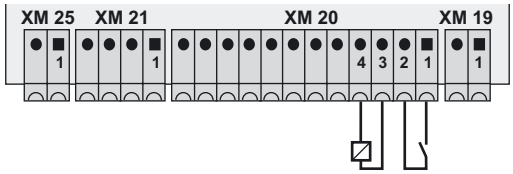
UPS cabinet



Key:

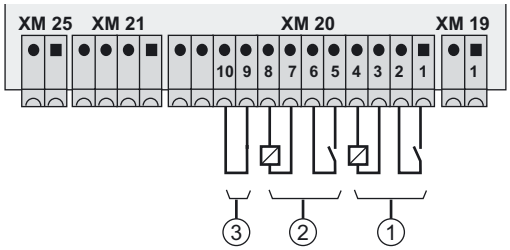
(1) Connectors
(2) Cable ties
(3) To the battery circuit breaker

Connecting a single battery circuit breaker



1 - Connect the UPS to the battery circuit breaker in the auxiliary cabinet as per the diagram opposite.
2 - Tie down the cable as shown in the UPS cabinet diagram.

Connecting two battery circuit breakers

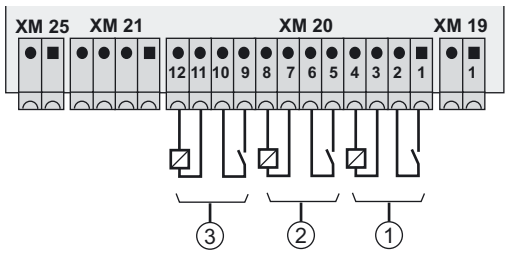


Key:

(1) Circuit breaker 1
(2) Circuit breaker 2
(3) Jumper (not supplied)

1 - Connect the UPS to the battery circuit breakers in the auxiliary cabinets as per the diagram opposite.
2 - Tie down the cable as shown in the UPS cabinet diagram.

Connecting three battery circuit breakers



Key:

(1) Circuit breaker 1
(2) Circuit breaker 2
(3) Circuit breaker 3

1 - Connect the UPS to the battery circuit breakers in the auxiliary cabinets as per the diagram opposite.
2 - Tie down the cable as shown in the UPS cabinet diagram.

The controls of circuit breakers 2 and 3 are not separated.

Connecting the battery temperature sensor

This operation must be carried out by qualified personnel.

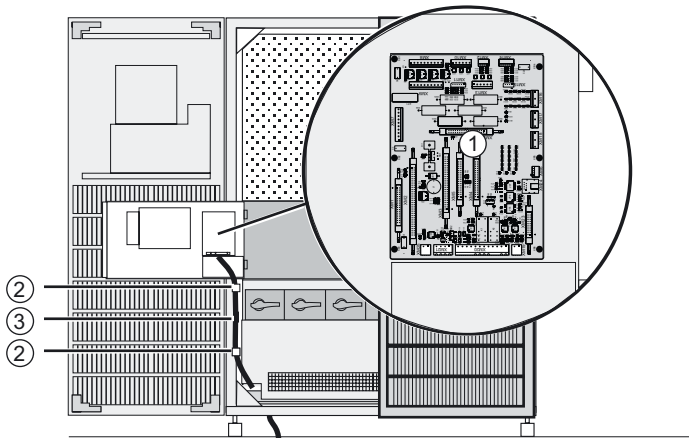
The UPS door must be open.

The **moving** door of the UPS must be open.

The cables (not supplied) must be **shielded, twisted-pair cables** (STP), with a size of 0.3 to 1.5 mm² / AWG22 to AWG16 and a maximum length of 100 m.

To ensure sufficient isolation of control-wire cables, they must be run separately from the power cables.

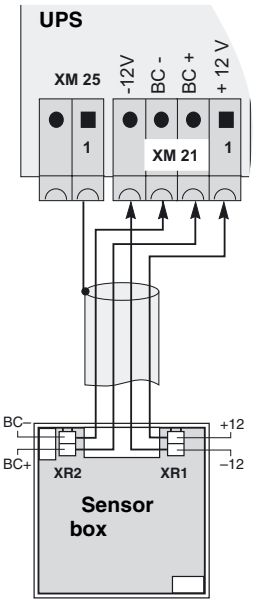
UPS cabinet



Key:

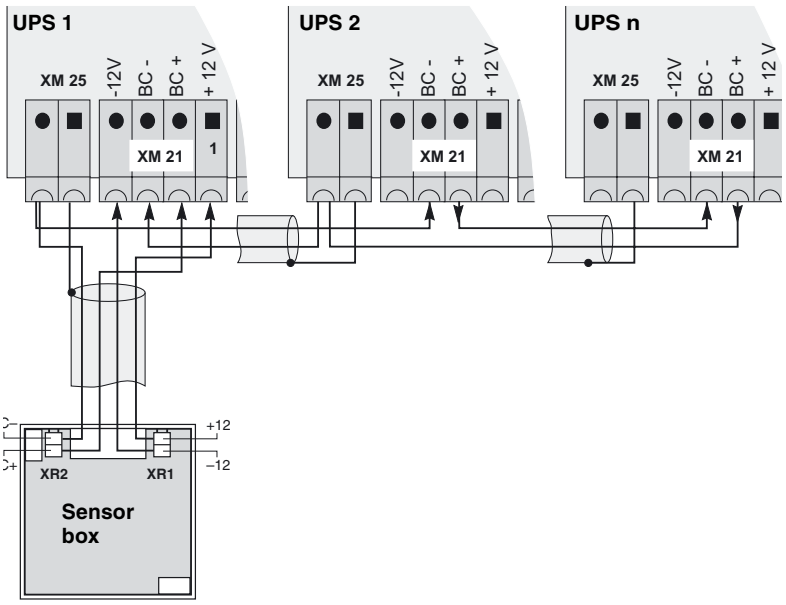
(1) Connectors
(2) Cable ties
(3) Cables

Connecting a sensor to a single UPS unit



1 - Connect the UPS to the temperature sensor in the auxiliary cabinet as per the diagram opposite (cables not supplied).
2 - Tie down the cable as shown in the UPS cabinet diagram.

The sensor may be located in a battery cabinet or in a battery room for batteries on racks.



1 - Connect the UPSs to the temperature sensor in the auxiliary cabinet as per the diagram opposite (cables not supplied).

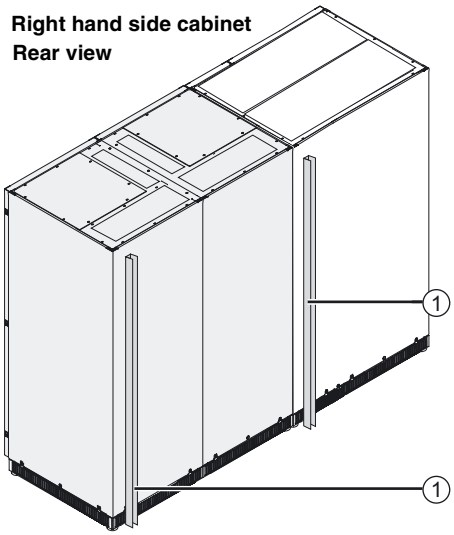
2 - Tie down the cable as shown in the UPS cabinet diagram.

The sensor may be located in a battery cabinet or in a battery room for batteries on racks.

2. Appendices

2.1 Assembling 2000 kVA SSCs

Right hand side cabinet
Rear view

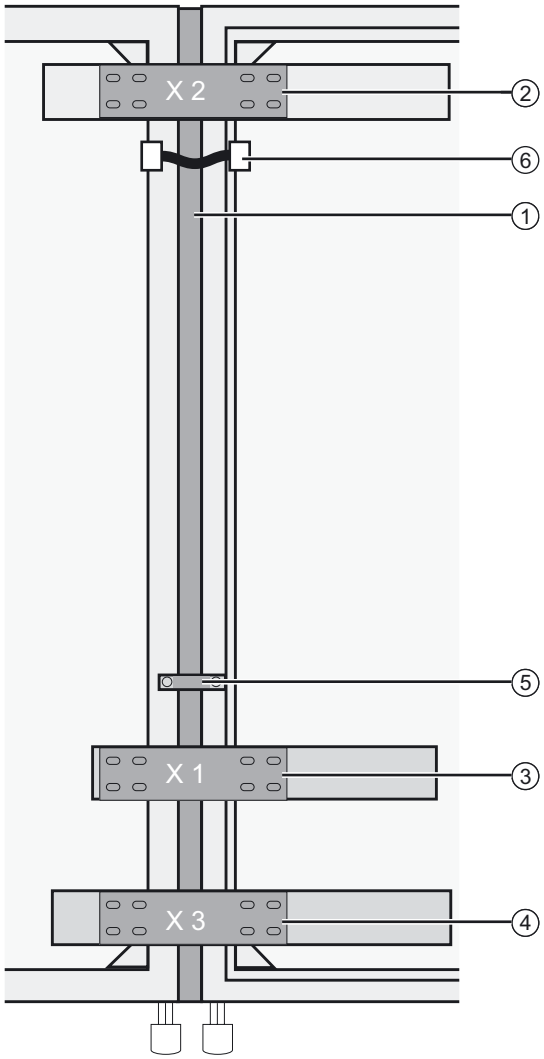


1 - Place the cabinets in their definitive position

2 - Adjust the front feet to ensure the cabinets are vertical and the doors aligned.

3 - Remove the two inter-cabinet uprights **(1)** located behind the right hand side cabinet.

Left hand side cabinet Right hand side cabinet
Front view



Fit the fishplates between the two cabinets (fourteen fishplates supplied in total):

4 - Align the fishplates horizontally

5 - Fit the two upper-part fishplates L1, L2, L3 **(2)** (six fishplates in total) between the 2 cabinets.

6 - Fit the two neutral fishplates **(3)** between the two cabinets.

7 - Fit the two lower-part fishplates L1, L2, L3 **(4)** (six fishplates in total) between the 2 cabinets.

8 - Connect the two earthing braids (5) between the front uprights of both cabinets

9 - Connect the auxiliary wires between the connectors (6) of both cabinets

10 - Fit the inter-cabinet uprights (1) between the two cabinets

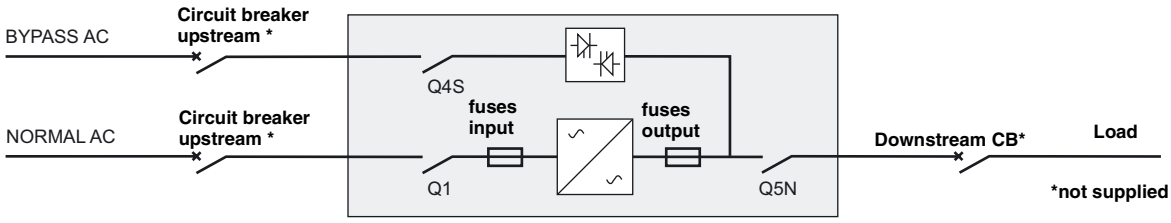
2.2 IP 32 option

Refer to the "IP 32" manual no. 3460028300 for more details on this option

2. Appendices

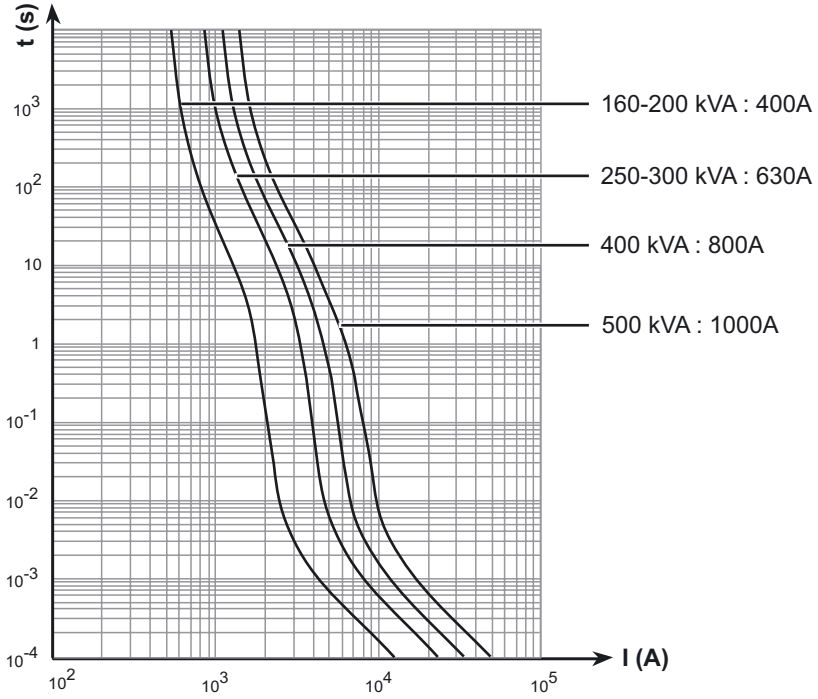
2.3 Electrical characteristics

Selection of protection devices



When sizing the upstream circuit breakers, the parameters below must be taken into account:

Time/current curves for UPS input and output fuses:



UPS short-circuit current with inverter coupled and bypass AC source out of tolerances:

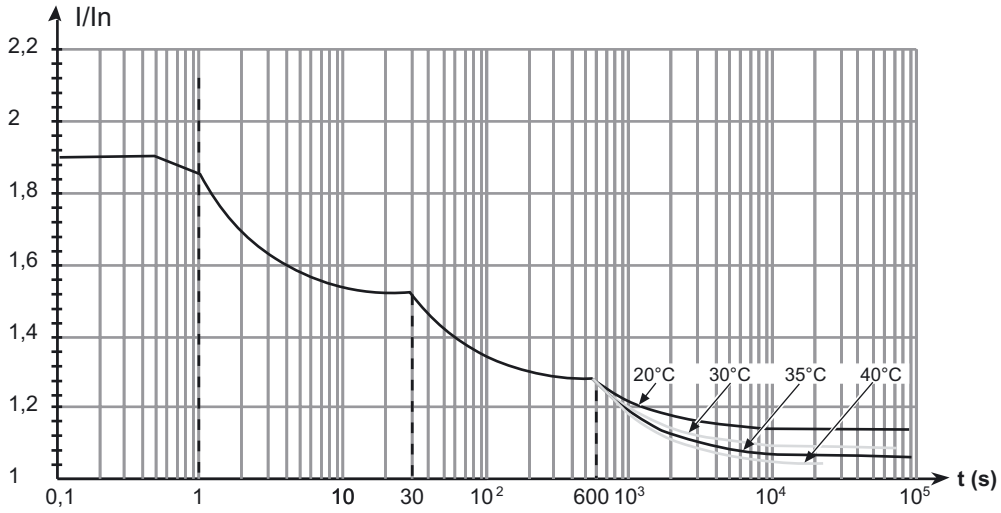
Sn	160 kVA	200 kVA	250 kVA	300 kVA	400 kVA	500 kVA
In (at 400 V)	231 A	289 A	361 A	433 A	577 A	721 A
Icc max	725 A	725 A	1030 A	1030 A	1374 A	1975 A
Icc min	570 A	570 A	793 A	793 A	1140 A	1470 A

Line-current values:

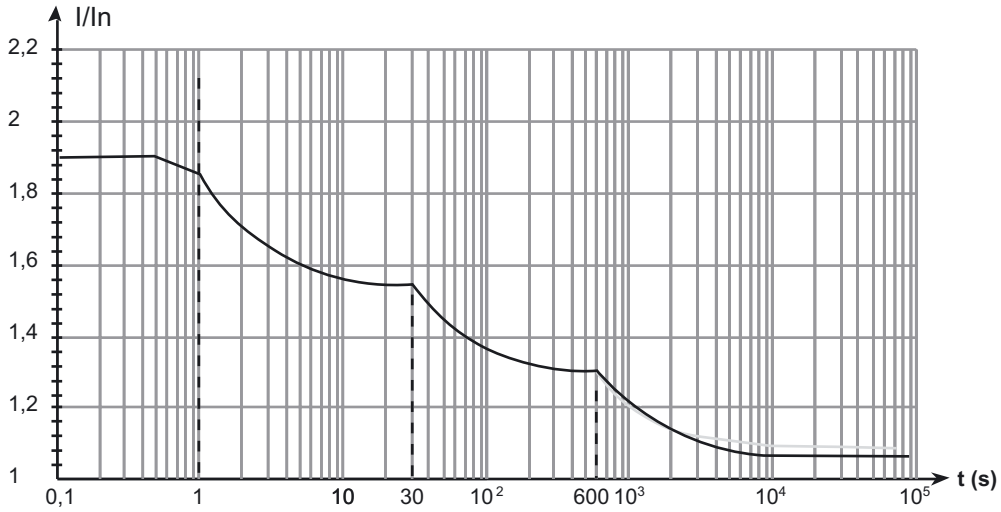
Rated power of each UPS unit	**Continuous input current at U=400V**	**Input current for load PF = 0.9, U = 400V at 1.25 In overload limited to 10 min.**	**Input current for load PF = 0.9, U = 400V at 1.5 In overload limited to 30 sec.**	**Input/output fuse ratings**
160	236 A	282 A	340 A	400 A
200	295 A	353 A	424 A	400 A
250 kVA	368 A	441 A	530 A	630 A
300 kVA	442 A	530 A	636 A	630 A
400 kVA	587 A	706 A	848 A	800 A
500 kVA	735 A	881 A	1058 A	1000 A

Permissible UPS overloads as a function of time

NORMAL mode operation



Bypass AC mode or SSC operation



2. Appendices

2.4 General characteristics of MGE™ Galaxy™ 7000 UPSs

UPS power in kVA	**160**		**200**		**250**		**300**		**400**		**500**	
Normal AC input												
Number of conductors	3 phases											
Reference voltage at Pn	380 V to 415 V											
Reference frequency	45 Hz to 66 Hz											
THDI	Typically 3% at Pn											
Power factor	> 0,99											
Bypass AC input												
Number of conductors	3 phases + neutral											
Reference voltage at Pn	380 V to 415 V											
Reference frequency	45 Hz to 66 Hz											
Load output												
Number of conductors	3 phases + neutral											
Set phase-to-phase voltages	380 V / 400 V / 415 V											
Set phase-to-neutral voltages	220 V / 230 V / 240 V											
Voltage variation	± 1%											
Adjustable frequencies and tolerance (on battery power)	50 Hz or 60 Hz ± 0.1 Hz											
Voltage variation for 0 to 100% load step impact	± 1%											
Permissible overloads	150% for 30 seconds, 125% for 10 minutes											
THDU Ph-to-Ph and Ph-to-N for non-linear load	< 2% Ph-to-Ph											
Battery												
Standard battery technology	Sealed lead-acid battery (gas-recombination) (Valve Regulated Lead Acid type)											
UPS power in kVA	**160**		**200**		**250**		**300**		**400**		**500**	
	PN/2	PN	PN/2	PN	PN/2	PN	PN/2	PN	PN/2	PN	PN/2	PN
Active power (kW)	72	144	90	180	112	225	135	270	180	360	225	450
Efficiency	92,0	93,2	93,0	93,0	93,2,	93,8	93,5	93,6	94,1	94,1	94,3	94,3
Heat losses in kW Heat losses in calories/s	6,3 1496	10,5 2511	6,8 1619	13,5 3238	8,2 1962	14,9 3554	9,4 2243	18,6 4449	11,3 2697	22,6 5395	13,6 3250	27,2 6501
Storage temperature range	-25°C to +45°C											
Operating temperature range at Pn	0°C to 35°C											
Relative humidity	45% to 75%											
Maximum operating altitude without derating	<1000 m											
Noise level (dBa)	75											
Product standards	IEC 62040											
Safety standards	IEC 62040-1-2											
Protection standards	IEC 62040-3											
EMC standards	IEC 62040-2											

Battery characteristics

	Sealed lead-acid battery	Vented lead-acid battery	Ni-Cd battery
Min/max number of cells	264/288	264/288	428/468
Floating voltage per cell	2.27V	2.2V	1.4V
Min/max floating voltage	600V / 654V	581V / 634V	600V / 655V
Min voltage per cell	1.65V to 1.9V	1.65V to 1.9V	Min threshold 1.1V

2. Appendices

2.5 Glossary

Backup time	Time that the connected loads can operate on battery power.
Bypass AC source	Source supplying the bypass line.The load can be transferred to the bypass line if an overload occurs on the UPS output, for maintenance or in the event of a malfunction.
Fin	UPS input frequency (normal or bypass AC input).
Inverter	UPS module that inputs DC power and outputs AC voltage and current.
Isc	Short-circuit current
Load	Devices or equipment connected to the UPS output.
Normal (double conversion) mode	The normal UPS operating mode. The AC source supplies the UPS which in turn supplies the connected loads (after electronic double conversion).
Normal AC source	Normal source of power for the UPS.
PE	Protective conductor
PEN	Conductor serving both as a protective conductor and a neutral conductor
PFC	Sinusoidal input module used to eliminate the harmonics reinjected in the upstream source by the UPS upstream.
Relay contacts	Contacts supplying information to the user in the form of signals.
SSC	Static-switch cabinet
Uin	UPS input voltage (normal or bypass AC input).
Uout	UPS output voltage.
UPS	Uninterruptible Power System

2. Appendices

Glossary >